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ENCYCLOPÆDIA BRITANNICA.

1 Boundaries, extent, &c.

CHINA, a country of Aſia, ſituated on the moſt eaſterly part of that continent. It is bounded on the north by Tartary; from which it is divided, partly by a prodigious wall of 1500 miles in length, and partly by high, craggy, and inacceſſible mountains. On the eaſt, it is bounded by the ocean; on the weſt, by part of the Mogul's empire, and India beyond the Ganges, from which it is parted by other ridges of high mountains and ſandy deſerts; on the ſouth, it is bounded partly by the kingdoms of Lao, Tonquin, Ava, and Cochin-China, and partly by the ſouthern or Indian ſea, which flows between it and the Philippine iſlands. There are ſeveral ways of computing its length and breadth. According to ſome of theſe, it is reckoned 1269, 1600, or 1800 miles in length, and as much in breadth: however, by the beſt and lateſt accounts, this vaſt country is ſomewhat of an oval form, the breadth being leſs than the length by little more than a fourth part.

2 Diviſion into provinces.

It contains 15 provinces, excluſive of that of Lyau-tong, which is ſituated without the great wall, though under the ſame dominion. Their names are, 1. Shenſi, 2. Shanſi, 3. Pecheli, which are ſituated on the north ſide, along the wall; 4. Shantong, 5. Kyan-nang, 6. Che-kyang, 7. Fo-kyen, which are ſituated along the eaſtern ocean; 8. Quang-tong, 9. Quang-ſi, 10. Yu-nan, 11. Se-chuen, which ſtretch themſelves towards the ſouth and ſouth-weſt; and, 12. Honan, 13. Hu-quand, 14. Quey-chew, 15. Kyang-ſi; which take up the middle part. For a particular deſcription of all theſe, ſee their proper articles.

3 Chineſe pretenſions to antiquity.

The origin of all nations is involved in obſcurity and fable, but that of the Chineſe much more ſo than any other. Every nation is inclined to aſſume too high an antiquity to itſelf, but the Chineſe carry theirs beyond all bounds. Indeed, though no people on earth are more exact in keeping records of every memorable tranſaction, yet ſuch is the genius of the Chineſe for ſuperſtition and fable, that the firſt part of their hiſtory is deſervedly contemned by every rational perſon.

4 Why their hiſtory is ſo uncertain.

What contributes more to the uncertainty of the Chineſe hiſtory is, that neither we, nor they themſelves, have any thing but fragments of their ancient hiſtorical books; for, about 213 years before Chriſt, the reigning emperor Si-whang-ti cauſed all the books in the empire to be burned, except thoſe written by lawyers and phyſicians. Nay, the more effectually to deſtroy the memory of every thing contained in them, he commanded a great number of learned men to be buried alive, leſt, from their memories, they ſhould commit to writing ſomething of the true memoirs of the empire. The inaccuracy of the Chineſe annals is complained of even by their moſt reſpected author Confucius himſelf; who alſo affirms, that before his time many of the oldeſt materials for writing ſuch annals had been deſtroyed.

5 Fabulous hiſtory of China.

According to the Chineſe hiſtories, the firſt monarch of the whole univerſe (that is, of China), was called *Puon-ku*, or *Puen-cu*. This, according to ſome, was the firſt man; but according to Bayer and Menzelius, two of the greateſt critics in Chineſe literature that have hitherto appeared, the word ſignifies *the higheſt antiquity*. Puon-ku was ſucceeded by *Tiene-hoang*, which ſignifies *the emperor of heaven*. They call him alſo the intelligent heaven, the ſupreme king of the middle heaven, &c. According to ſome of their hiſtorians, he was the inventor of letters, and of the cyclic characters by which they determine the place of the year, &c. Tiene-hoang was ſucceeded by Ti-hoang (the emperor of the earth), who divided the day and night, appointing 30 days to make one moon, and fixed the winter ſolſtice to the 11th moon. Ti-hoang was ſucceeded by Gine-hoang (ſovereign of men), who with his nine brothers ſhared the government among them. They built cities, and ſurrounded them with walls; made a diſtinction between the ſovereign and ſubjects; inſtituted marriage, &c.

The reigns of theſe four emperors make up one of what the Chineſe called *ki*, “ages,” or “periods,” of which there were nine before Fo-hi, whom their moſt ſenſible people acknowledge as the founder of their empire.

The hiſtory of the ſecond *ki* contradicts almoſt every thing ſaid of the firſt; for though we have but juſt now been told that Gine-hoang and his brethren built cities ſurrounded with walls; yet, in the ſucceeding age, the people dwelt in caves, or perched upon trees as it were in neſts. Of the third *ki* we hear nothing; and in the fourth, it ſeems matters had been ſtill worſe, as we are told that men were then only taught to retire into the hollows of rocks. Of the fifth and ſixth we have no accounts. Theſe ſix periods, according to ſome writers, contained 90,000 years; according to others, 1,100,750.

In the ſeventh and eighth *ki*, they tell us over again what they had ſaid of the firſt; namely, that men began to leave their caves and dwell in houſes, and were taught to prepare clothes, &c. Tchine-fang, the firſt monarch of the eighth *ki*, taught his ſubjects to take off the hair from ſkins with rollers of wood, and cover themſelves with the ſkins ſo prepared. He taught them alſo to make a kind of web of their hair, to ſerve as a covering to their heads againſt rain. They obeyed his orders with joy, and he called his ſubjects *people clothed with ſkins*. His reign laſted 350 years; that of one of his ſucceſſors, alſo, named Yeou-tſao-chi, laſted more than 300; and his family continued for 12 or 18,000 years. But what is very ſurpriſing, all theſe thouſands and millions of years had elapſed without mankind's having any knowledge of fire. This was not diſcovered till towards the cloſe of this period, by one Souigine. After ſo uſeful a diſcovery, he taught the people to dreſs their victuals; whereas before they had devoured the fleſh of animals quite raw, drunk their blood, and ſwallowed even their hair and feathers. He is alſo ſaid to have been the inventor of fiſhing, letters, &c.

In the ninth period, we find the invention, or at leaſt the origin of letters, attributed to one Tſang-hie, who received them from a divine tortoiſe that carried them on his ſhell, and delivered them into the hands of Tſang hie. During this period alſo, muſic, money, carriages, merchandiſe, commerce, &c. were invented. There are various calculations of the length of theſe *ki* or periods. Some make the time from Puan-ku to Confucius, who flouriſhed about 479 years before Chriſt, to contain 279,000 years; others, 2,276,000; ſome, 2,759,860 years; others, 3,276,000; and ſome no leſs than 96,961,740 years.

6 Fabulous hiſtory explained. Theſe extravagant accounts are by ſome thought to contain obſcure and imperfect hints concerning the coſmogony and creation of the world, &c. Puon-ku, the firſt emperor, they think, repreſents eternity preceding the duration of the world. The ſucceeding ones, Tiene-hoang, Ti-hoang, and Gine-hoang, they imagine, ſignify the creation of the heavens and earth, and the formation of man. The ten *ki* or ages, nine of which preceded Fo hi, mean the ten generations preceding Noah. This may very poſſibly be the caſe; for about 300 years before Chriſt, ſome Jews travelled into China, who might have made the Moſaic writings known there.

What we have now related, contains the ſubſtance of that part of the Chineſe hiſtory which is entirely fabulous. After the nine *ki* or "ages" already taken notice of, the tenth commenced with Fo-hi; and the hiſtory, though ſtill very dark, obſcure, and fabulous, begins to grow ſomewhat more conſiſtent and intelligible. 7 Reign of Fo-hi. Fo-hi was born in the province of Shenſi. His mother walking upon the bank of a lake in that province, ſaw a very large print of a man's foot in the ſand there; and, being ſurrounded by an iris or rainbow, became impregnated. The child was named *Fo-hi*; and, when he grew up, was by his countrymen elected king, on account of his ſuperior merit, and ſtyled *Tyent-tſe*, that is, "the ſon of heaven." He invented the eight *qua*, or ſymbols, conſiſting of three lines each, which, differently combined, formed 64 characters that were made uſe of to expreſs every thing. To give theſe the greater credit, he pretended that he had ſeen them inſcribed on the back of a dragon-horſe (an animal ſhaped like a horſe, with the wings and ſcales of a dragon), which aroſe from the bottom of a lake. Having gained great reputation among his countrymen by this prodigy, he is ſaid to have created mandarins or officers, under the name of *dragons*. Hence we may aſſign a reaſon why the emperors of China always carry a dragon in their banners. He alſo inſtituted marriage, invented muſic, &c. Having eſtabliſhed a prime miniſter, he divided the government of his dominions among four mandarins, and died after a reign of 115 years.

8 Miraculous ſolſtice. After Fo-hi followed a ſucceſſion of emperors, of whom nothing remarkable is recorded, except that in the reign of *Yau*, the ſeventh after Fo-hi, the ſun did not ſet for ten days, ſo that the Chineſe were afraid of a general conflagration. 9 Hypotheſis concerning this ſolſtice and Fo-hi. This event the compilers of the Univerſal Hiſtory take to be the ſame with that mentioned in the book of Joſhua, when the ſun and moon ſtood ſtill for about the ſpace of a day. Fo-hi they will have to be the ſame with Noah. They imagine, that after the deluge this patriarch remained ſome time with his deſcendants; but on their wicked combination to build the tower of Babel, he ſeparated himſelf from them with as many as he could perſuade to go along with him; and that, ſtill travelling eaſtward, he at laſt entered the fertile country of China, and laid the foundation of that vaſt empire.—But, leaving theſe fabulous and conjectural times, we ſhall proceed to give ſome account of that part of the Chineſe hiſtory which may be more certainly depended on.

As the Chineſe, contrary to the practice of almoſt all nations, have never ſought to conquer other countries, but rather to improve and content themſelves with their own, their hiſtory for many ages furniſhes nothing remarkable. The whole of their emperors, abſtracting from thoſe who are ſaid to have reigned in the fabulous times, are comprehended in 22 dynaſties, mentioned in the following table.

	Emperors.	Before Chriſt.
1. *Hya*, containing	17	2207
2. *Shang*, or *Ing*,	28	1766
3. *Chew*,	35	1122
4. *Tſin*,	4	248
5. *Han*,	25	206
		After Chriſt.
6. *Hew-han*,	2	220
7. *Tſin*,	15	465
8. *Song*,	8	220
9. *Tſi*,	5	479
10. *Lyang*,	4	502
11. *Chin*,	4	557
12. *Swi*,	3	
13. *Twang*,	20	618
14. *Hew-lyang*,	2	907
15. *Hew-tang*,	4	923
16. *Hew-tſin*,	2	936
17. *Hew-han*,	2	947
18. *Hew-chew*,	3	951
19. *Song*,	18	960
20. *Iwen*,	9	1280
21. *Ming*,	16	1368
22. *Tſing*,		1645

This table is formed according to the accounts of the Jeſuit Du Halde, and is commonly reckoned to be the moſt authentic; but according to the above-mentioned hypotheſis of the compilers of the Univerſal Hiſtory, who make *Yau* cotemporary with Joſhua, the dynaſty of *Hya* did not commence till the year before Chriſt 1357; and to accommodate the hiſtory to their hypotheſis, great alterations muſt be made in the duration of the dynaſties.

10
Incurſions of the Tartars.

The moſt intereſting particulars of the Chineſe hiſtory relate only to the incurſions of the Tartars, who at laſt conquered the whole empire, and who ſtill continue to hold the ſovereignty; though by transferring the ſeat of the empire to Peking, and adopting the Chineſe language, manners, &c. Tartary would ſeem rather to have been conquered by China, than China by Tartary. Theſe incurſions are ſaid to have begun very early; even in the time of the emperor Shun, ſucceſſor to Yau above mentioned, in whoſe reign the miraculous ſolſtice happened. At this time, the Tartars were repulſed, and obliged to retire into their own territories. From time to time, however, they continued to threaten the empire with invaſions, and the northern provinces were often actually ravaged by the Tartars in the neighbourhood. About the year before Chriſt 213, Shi-whang-ti, having fully ſubdued all the princes, or kings as they were called, of the different provinces, became emperor of China with unlimited power. He divided the whole empire into 36 provinces; and finding the northern part of his dominions much incommoded by the invaſions of the neighbouring barbarians, he ſent a formidable army againſt them, which drove them far beyond the boundaries of China. To prevent their return, he built the famous wall already mentioned, which ſeparates China from Tartary. After this, being elated with his own exploits, he formed a deſign of making poſterity believe that he himſelf had been the firſt Chineſe emperor that ever ſat on the throne. For this purpoſe, he ordered all the hiſtorical writings to be burnt, and cauſed many of the learned to be put to death, as already mentioned.

11
Great wall built.

12
Kitan Tartars ſettle in China.

What effect the great wall for ſome time had in preventing the invaſions of the Tartars, we are not told; but in the tenth century of the Chriſtian era, thoſe of Kitan or Lyau got a footing in China. The Kitan were a people of eaſtern Tartary, who dwelt to the north and north-eaſt of the province of Pecheli in China, particularly in that of Lyau-tong, lying without the great wall. Theſe people having ſubdued the country between Korea and Kaſhgar, became much more troubleſome to the Chineſe than all the other Tartars. Their empire commenced about the year 916, in the fourth year of Mo-ti-kyan-ti, ſecond emperor of the 14th Chineſe dynaſty called *Hew-Lyang*. In 946, Mingt-ſong, ſecond emperor of the 15th dynaſty, being dead, Sheking-tang his ſon-in-law rebelled againſt Mingt-ſong, his ſon and ſucceſſor, whom he deprived of his crown and life. This he accompliſhed by means of an army of 50,000 men furniſhed by the Kitan. Fi-ti, the ſon of Mingt-ſong, being unable to reſiſt the uſurper, fled to the city Ghey-chew; where ſhutting himſelf up with his family and all his valuable effects, he ſet fire to the palace, and was burnt to aſhes. On his death, Sheking-tang aſſumed the title of emperor; founded the 16th dynaſty; and changed his name to that of *Kaut-ſu*. But the Kitan general refuſing to acknowledge him, he was obliged to purchaſe a peace by yielding up to the Tartars 16 cities in the province of Pecheli, beſides a yearly preſent of 300,000 pieces of ſilk.

This ſubmiſſion ſerved only to inflame the avarice and ambition of the Kitan. In 959, they broke the treaty when leaſt expected, and invaded the empire afreſh. Tſi-vang, the emperor at that time, oppoſed them with a formidable army; but through the treachery of his general Lyew-chi-ywen, the Tartars were allowed to take him priſoner. On this, Tſi-vang was glad to recover his liberty, by accepting of a ſmall principality; while the traitor became emperor of all China, and, changing his name to *Kaut-ſu*, founded the 17th dynaſty. The Tartars, in the mean time, ravaged all the northern provinces without oppoſition, and then marched into the ſouthern. But being here ſtopped by ſome bodies of Chineſe troops, the general thought proper to retire with his booty into Tartary. In 962, Kaut-ſu dying, was ſucceeded by his ſon In-ti. The youth of this prince gave an opportunity to the eunuchs to raiſe commotions; eſpecially as the army was employed at a diſtance in repelling the invaſions of the Tartars. This army was commanded by Ko-ghey, who defeated the enemy in ſeveral battles, and thus reſtored peace to the northern provinces. In the mean time, In-ti was ſlain by his eunuchs, and the empreſs placed his brother on the throne: but Ko-ghey, returning in triumph, was ſaluted emperor by his victorious army; and the empreſs being unable to ſupport the rights of her ſon, was obliged to ſubmit, while Ko-ghey, aſſuming the name of *Tay-tſu*, founded the 18th dynaſty. Nine years after this, however, the grandees of the empire, ſetting aſide Kong-ti, the third in ſucceſſion from Tay-tſu, on account of his non-age, proclaimed his guardian, named *Chau-quang-yu*, emperor; who, aſſuming the name of Kau-tſu, founded the 19th dynaſty, called *Song* or *Tſong*.

Under this monarch the empire began to recover itſelf; but the Kitan ſtill continued their incurſions. The ſucceſſors of Kau-tſu oppoſed them with various ſucceſs; but at laſt, in 978, the barbarians became ſo ſtrong as to lay ſiege to a conſiderable city. Tay-tſong, ſucceſſor to Kau-tſu, detached 300 ſoldiers, each carrying a light in his hand, againſt them in the night-time, with orders to approach as near as poſſible to the Tartar camp. The barbarians, imagining, by the number of lights, that the whole Chineſe army was at hand, immediately fled, and, falling into the ambuſcades laid for them by the Chineſe general, were almoſt all cut to pieces.

This check, however, did not long put a ſtop to the ravages of the Kitan. In the year 999, they laid ſiege to a city in the province of Pecheli; but Ching-tſong, ſucceſſor to Tay-tſong, came upon them with his army ſo ſuddenly, that they betook themſelves to flight. The emperor was adviſed to take advantage of their conſternation, and recover the country which had been yielded to them; but inſtead of purſuing his victory, he bought a peace by conſenting to pay annually 100,000 tael (about 34,000l.), and 200,000 pieces of ſilk. The youth and pacific diſpoſition of

Jin-tſong, ſucceſſor to Ching tſong, revived the courage of the Kitan; and, in 1035, war would have been renewed, had not the emperor condeſcended to as ſhameful a treaty as that concluded by his father. Two years after, the Tartars demanded reſtitution of ten cities in the province of Pecheli, which had been taken by Ko-ghey founder of the 18th dynaſty; upon which Jin-tſong engaged to pay them an annual tribute of 200,000 taels of ſilver, and 300,000 pieces of ſilk, in lieu of theſe cities.

13
Kitan driven out by the eaſtern Tartars;

From this time the Kitan remained in peaceable poſſeſſion of their Chineſe dominions till the year 1117. Whey-tſong, at that time emperor, being able neither to bear their ravages, nor by himſelf to put a ſtop to them, reſolved upon a remedy which at laſt proved worſe than the diſeaſe. This was to call in the Nu-che, Nyu-che, or Eaſtern Tartars, to deſtroy the kingdom of the Kitan. From this he was diſſuaded by the king of Korea, and moſt of his own miniſters; but, diſregarding their ſalutary advice, he joined his forces to thoſe of the Nu-che. The Kitan were then everywhere defeated; and at laſt reduced to ſuch extremity, that thoſe who remained were forced to leave their country, and fly to the mountains of the weſt.

14
Who aſſume the name of *Kin*, and invade China.

Thus the empire of the Kitan was totally deſtroyed, but nothing to the advantage of the Chineſe; for the Tartar general, elated with his conqueſt, gave the name of *Kin* to his new dominion, aſſumed the title of emperor, and began to think of aggrandizing himſelf and enlarging his empire. For this purpoſe, he immediately broke the treaties concluded with the Chineſe emperor; and, invading the provinces of Pecheli and Shenſi, made himſelf maſter of the greater part of them. Whey-tſong, finding himſelf in danger of loſing his dominions, made ſeveral advantageous propoſals to the Tartar; who, ſeeming to comply with them, invited him to come and ſettle matters by a perſonal conference. The Chineſe monarch complied: but, on his return, the terms agreed on ſeemed intolerable to his miniſters; ſo that they told him the treaty could not ſubſiſt, and that the moſt cruel war was preferable to ſuch an ignominious peace. The Kin monarch, being informed of all that paſſed, had recourſe to arms, and took ſeveral cities. Whey-tſong was weak enough to go in perſon to hold a ſecond conference; but, on his arrival, was immediately ſeized by the Tartar. He was kept priſoner under a ſtrong guard during the remaining part of his life; and ended his days in 1126, in the deſert of Shamo, having nominated his eldeſt ſon Kin-tſong to ſucceed him.

15
They take the emperor priſoner.

Kin-tſong began his reign with putting to death ſix miniſters of ſtate, who had betrayed his father into the hands of the Kin Tartars. The barbarians in the mean time purſued their conqueſts without oppoſition. They croſſed the Whang-ho, or Yellow river, which a handful of troops might have prevented; and marching directly towards the imperial city, took and plundered it. Then ſeizing the emperor and his conſort, they carried them away captives: but many of the principal lords, and ſeveral of the miniſters, preferring death to ſuch an ignominious bondage, killed themſelves. The Kin being informed by the empreſs *Meng* that ſhe had been divorced, they left her behind. This proved the means of ſaving the empire; for by her wiſdom and prudence ſhe got the crown placed on the head of Kau-tſong, ninth ſon of the emperor Whey tſong by his divorced empreſs.

16
Imperial city and another emperor taken.

Kau-tſong fixed his court at Nanking the capital of Kyang-nan; but ſoon after was obliged to remove it to Kang-chew in Che-kyang. He made ſeveral efforts to recover ſome of his provinces from the Kin, but without effect. Ili-tſong the Kin monarch, in the mean time, endeavoured to gain the eſteem of his Chineſe ſubjects by paying a regard to their learning and learned men, and honouring the memory of Confucius. Some time after, he advanced to Nanking, from whence Kau-tſong had retired, and took it: but, receiving advice that Yo ſi, general of the Song, or ſouthern Chineſe, was advancing by long marches to the relief of that city, they ſet fire to the palace, and retired northward. However, Yo-ſi arrived time enough to fall upon their rear-guard, which ſuffered very much; and from this time the Kin never dared to croſs the river Kyang. In a few years afterwards the Chineſe emperor ſubmitted to become tributary to the Kin, and concluded a peace with them upon very diſhonourable terms. This ſubmiſſion, however, was of little avail: for, in 1163, the Tartars broke the peace, and, invading the ſouthern province with a formidable army, took the city of Yang-chew. The king, having approached the river Kyang, near its mouth, where it is wideſt as well as moſt rapid, commanded his troops to croſs it, threatening with his drawn ſword to kill thoſe who refuſed. On receiving ſuch an unreaſonable command, the whole army mutinied; and the king being killed in the beginning of the tumult, the army immediately retired.

17
Progreſs of the Kin checked.

18
They are attacked by Jenghiz-khan and the king of Hya.

From this time to the year 1210, nothing remarkable occurs in the Chineſe hiſtory; but this year, Jenghiz-khan, chief of the weſtern Tartars, *Moguls* or *Mungls*, quarrelled with Yong-tſi emperor of the Kin; and at the ſame time the king of Hya, diſguſted at being refuſed aſſiſtance againſt Jenghiz-khan, threatened him with an invaſion on the weſt ſide. Yong-tſi prepared for his defence; but in 1211, receiving news that Jenghiz-khan was advancing ſouthward with his whole army, he was ſeized with fear, and made propoſals of peace, which were rejected. In 1212, the Mogul generals forced the great wall; or, according to ſome writers, had one of the gates treacherouſly opened to them, to the north of Shanſi; and made incurſions as far as Peking, the capital of the Kin empire. At the ſame time the province of Lyau-tong was almoſt totally reduced by ſeveral Kitan lords who had joined Jenghiz khan; ſeveral ſtrong places were taken, and an army of 300,000 Kin defeated by the Moguls. In autumn they laid ſiege to the city of Tay-tong fu; where, although the governor Hujaku fled, yet Jenghiz-khan met with conſiderable reſiſtance. Having loſt a vaſt number of men, and being himſelf wounded by an arrow, he was obliged to raiſe the ſiege and retire into Tartary; after which the Kin retook ſeveral cities. The next year, however, Jenghiz khan re-entered China; retook the cities which the Kin had reduced the year before; and overthrew

19
Great wall forced by Jenghiz-khan.

their armies in two bloody battles, in one of which the ground was ſtrewed with dead bodies for upwards of four leagues.

The ſame year Yong-tſi was ſlain by his general Hujaku; and Sun, a prince of the blood, advanced in his room. After this the Moguls, attacking the empire with four armies at once, laid waſte the provinces of Shanſi, Honan, Pecheli, and Shantong. In 1214 Jenghiz-khan ſat down before Peking; but inſtead of aſſaulting the city, offered terms of peace, which were accepted, and the Moguls retired into Tartary. After their departure, the emperor, leaving his ſon at Peking, removed his court to Pyen lyang near Kay-fong-fu, the capital of Honan. At this Jenghiz-khan being offended, immediately ſent troops to beſiege Peking. The city held out to the fifth month of the year 1215, and then ſurrendered. At the ſame time the Moguls finiſhed the conqueſt of Lyau-tong; and the Song refuſed to pay the uſual tribute to the Kin.

2
Peking taken.

21
Southern Chineſe declared war againſt the Kin.

In 1216, Jenghiz-khan returned to purſue his conqueſt in the weſt of Aſia, where he ſtaid ſeven years; during which time his general Muhuli made great progreſs in China againſt the Kin emperor. He was greatly aſſiſted by the motions of Ning-tſong emperor of the Song, or ſouthern China; who, incenſed by the frequent perfidies of the Kin, had declared war againſt them, and would hearken to no terms of peace, though very advantageous propoſals were made. Notwithſtanding this, however, in 1220, the Kin, exerting themſelves, raiſed two great armies, one in Shenſi, and the other in Shan-tong. The former baffled the attempts of the Song and king of Hya, who had united againſt them; but the latter, though no fewer than 200,000, were entirely defeated by Muhuli. In 1221, that officer paſſed the Whang-ho, and died after conquering ſeveral cities.

22
Jenghiz-khan deſtroys the kingdom of Hya;

23
And dies.

In 1224, the Kin emperor died; and was ſucceeded by his ſon Shew, who made peace with the king of Hya; but next year, that kingdom was entirely deſtroyed by Jenghiz-khan. In 1226, Oktay, ſon to Jenghiz-khan, marched into Honan, and beſieged Kay-fong-fu, capital of the Kin empire, but was obliged to withdraw into Shenſi, where he took ſeveral cities; and cut in pieces an army of 30,000 men. In 1227 Jenghiz khan died, after having deſired his ſons to demand a paſſage for their army through the dominions of the Song, without which he ſaid they could not eaſily vanquiſh the Kin.

24
Moguls uarrel ith the ong,

25
Exploits of Toley.

After the death of that great conqueror, the war was carried on with various ſucceſs; but though the Moguls took above 60 important poſts in the province of Shenſi, they found it impoſſible to force Ton-quan, which it behoved them to do in order to penetrate effectually into Honan. In April 1231 they took the capital of Shenſi, and defeated the Kin army which came to its relief. Here one of the officers deſired Prince Toley to demand a paſſage from the Song through the country of Han-chong fu. This propſal Toley communicated to his brother Otkay, who approved of it as being conformable to the dying advice of Jenghiz-khan. Hereupon Toley, having aſſembled all his forces, ſent a meſſenger to the Song generals to demand a paſſage through their territories. This, however, they not only refuſed, but put the meſſenger to death; which ſo enraged Toley that he ſwore to make them repent of it, and was ſoon as good as his word. He decamped in Auguſt 1231; and having forced the paſſes, put to the ſword the inhabitants of Wha-yang and Fong-chew, two cities in the diſtrict of Hang-chong-fu. Then having cut down rocks to fill up deep abyſſes, and made roads through places almoſt inacceſſible, he came and beſieged the city of Han-chong-fu itſelf. The miſerable inhabitants fled to the mountains on his approach, and more than 100,000 of them periſhed. After this, Toley divided his forces, conſiſting of 30,000 horſe, into two bodies. One of theſe went weſtward to Myen-chew: from thence, after opening the paſſages of the mountains, they arrived at the river Kyaling, which runs into the great Kyang. This they croſſed on rafts made of the wood of demoliſhed houſes; and then, marching along its banks, ſeized many important poſts. At laſt, having deſtroyed more than 140 cities, towns, or fortreſſes, they returned to the army. The ſecond detachment ſeized an important poſt in the mountains, called *Toutong*, ſix or ſeven leagues to the eaſtward of Hang-chong-fu. On the other ſide Oktay advanced, in October, towards Pu-chew a city of Shanſi; which being taken after a vigorous defence, he prepared to paſs the Whang-ho. Toley, after ſurmounting incredible difficulties, arrived in December on the borders of Honan, and made a ſhow as if he deſigned to attack the capital of the Kin empire. On his firſt appearance in Honan through a paſſage ſo little ſuſpected, every body was filled with terror and aſtoniſhment, ſo that he proceeded for ſome time without oppoſition. At laſt the emperor ordered his generals, Hota, Ilapua, and others, to march againſt the enemy. Toley boldly attacked them; but was obliged to retire, which he did in good order. Hota was for purſuing him, ſaying that the Mogul army did not exceed 30,000 men, and that they ſeemed not to have eaten any thing for two or three days. Ilapua, however, was of opinion that there was no occaſion for being ſo haſty, as the Moguls were incloſed between the rivers Han and Whang-ho, ſo that they could not eſcape. This negligence they ſoon had occaſion to repent of: for Toley, by a ſtratagem, made himſelf maſter of their heavy baggage; which accident obliged them to retire to Tang-chew. From thence they ſent a meſſenger to acquaint the emperor that they had gained the battle, but concealed the loſs of their baggage. This good news filled the court with joy; and the people who had retired into the capital for its defence, left it again, and went into the country: but, in a few days after, the vanguard of the Moguls, who had been ſent by the emperor Oktay, appeared in the field, and carried off a great number of thoſe that had quitted the city.

26
Capital of the Kin empire beſieged

In January 1232, Oktay paſſing the Whang-ho, encamped in the diſtrict of Kay-fong-fu, capital of the Kin empire, and ſent his general Suputay to beſiege the city. At that time the place was near 30 miles in circumference; but having only 40,000 ſoldiers to defend it, as many more from the neighbouring cities, and 20,000 peaſants, were ordered into it; while the emperor publiſhed an affecting declaration, animating the people to defend it to the laſt extremity. Oktay, having heard with joy of Toley's entrance into Honan, ordered him to ſend ſuccours to Suputay. On the other hand, the Kin generals advanced with 150,000 men to relieve the city; but being obliged to divide their forces, in order to avoid in part the great road, which Toley had obſtructed with trees, they were attacked by that prince at a diſadvantage, and, after a faint reſiſtance, defeated with great ſlaughter, and the loſs of both their generals, one killed and the other taken. The emperor now ordered the army at Tong-quan and other fortified places to march to the relief of Kay-fong-fu. They aſſembled accordingly, to the number of 110,000 foot and 15,000 horſe; and were followed by vaſt numbers of people, who expected by their means to be protected from the enemy. But many of theſe troops having deſerted, and the reſt being enfeebled by the fatigues of their march, they diſperſed on the approach of their purſuers, who killed all they found in the highways. After this the Moguls took Tong-quan and ſome other conſiderable poſts; but were obliged to raiſe the ſieges of Quey-te-fu and Loyang by the bravery of the governors. Kyang-ſhin, governor of Loyang, had only 3 or 4000 ſoldiers under him, while his enemies were 30,000 ſtrong. He placed his worſt ſoldiers on the walls, putting himſelf at the head of 400 brave men; whom he ordered to go naked, and whom he led to all dangerous attacks. He invented engines to caſt large ſtones, which required but few hands to play them, and aimed ſo true as to hit at 100 paces diſtance. When their arrows failed, he cut thoſe ſhot by the enemy into four pieces; pointed them with pieces of braſs coin; and diſcharged them from wooden tubes with as much force as bullets are from a muſket. Thus he haraſſed the Moguls for three months ſo grievouſly, that they were obliged, notwithſtanding their numbers, to abandon the enterpriſe.

27
Bravery of the beſieged.

Oktay, at laſt, notwithſtanding his ſucceſſes, reſolved to return to Tartary; and offered the Kin emperor peace, provided he became tributary, and delivered up to him 27 families which he named. Theſe offers were very agreeable to the emperor; but Suputay, taking no notice of the treaty, puſhed on the ſiege of the capital with more vigour than ever. By the help of the Chineſe ſlaves in his army, the Mogul general ſoon filled the ditch; but all his efforts ſeemed only to inſpire the beſieged with new vigour. The Moguls at that time made uſe of artillery, but were unable to make the leaſt impreſſion upon the city walls. They raiſed walls round thoſe they beſieged, which they fortified with ditches, towers, and battlements. They proceeded alſo to ſap the walls of the city; but were very much annoyed by the artillery of the beſieged, eſpecially by their bombs, which ſinking into the galleries, and burſting under ground, made great havock among the miners. For 16 days and nights the attacks continued without intermiſſion; during which time an incredible number of men periſhed on both ſides; at length, Suputay, finding that he could not take the city, withdrew his troops, under pretence of conferences being on foot. Soon after the plague began in Kay-fong-fu; and raged with ſuch violence, that, in 50 days, 900,000 biers were carried out, beſides a vaſt multitude of the poorer ſort who could not afford any

28
Peace concluded;

29
And broken.

In a ſhort time, two unlucky accidents occaſioned a renewal of the war; which now put an end to the empire of the Kin. Gan-yong, a young Mogul lord, having aſſumed the government of ſome cities in Kyang-nan, and killed the officer ſent to take poſſeſſion of them, declared for the Kin. The emperor unwarily took Gan-yong into his ſervice, and gave him the title of prince. Upon this Oktay ſent an envoy, attended by 30 other perſons, to inquire into the affair; but the Kin officers killed them all, without being puniſhed by the emperor. Suputay, having informed his maſter of all theſe proceedings, was ordered to continue the war in Honan. Shew-fu now commanded his officers to unite their troops for the defence of the capital; but before his orders could be obeyed, they were attacked and defeated, one after another, by the Moguls. This obliged him to raiſe ſoldiers from among the peaſants, for whoſe ſubſiſtence the people were taxed $\frac{3}{10}$ths of the rice they poſſeſſed. The city began now to be diſtreſſed for want of proviſions; and as it was but in a bad poſture of defence, the emperor marched with an army againſt the Moguls. His expedition proved unfortunate; for, ſending part of his army to beſiege a city called *Why-chew*, it was totally cut in pieces, and Suputay a ſecond time ſat down before the capital.

30
Capital again beſieged,

31
And taken.

On hearing this bad news, the emperor repaſſed the Whang-ho, and retired to Quey-te-fu. Here he had not been long before the capital was delivered up by treachery, and Suputay put all the males of the imperial race to death; but, by the expreſs command of Oktay, ſpared the inhabitants, who are ſaid to have amounted to 1,400,000 families. After this diſaſter, the unhappy monarch left his troops at Quey-te-fu, and retired to Juning-fu, a city in the ſouthern part of Honan, attended only by 400 perſons. Here the diſtance of the Moguls made him think of living at eaſe; but while he flattered himſelf with theſe vain hopes, the enemy's army arrived before the city and inveſted it. The garriſon were terrified at their approach; but were encouraged by the emperor, and his brave general Hu-ſye-hu, to hold out to the laſt. As there was not in the city a ſufficient number of men, the women, dreſſed in men's clothes, were employed to carry wood, ſtones, and other neceſſary materials to the walls. All their efforts, however, were ineffectual. They were reduced to ſuch extremities, that for three months they fed on human fleſh; killing the old and feeble, as well as many priſoners, for food. This being known to the Moguls, they made a general aſſault in January 1234. The attack continued from morning till night; but at laſt the aſſailants were repulſed. In this action, however, the Kin loſt all their beſt officers; upon which the emperor reſigned the crown to Cheng-lin a prince of the blood. Next morning, while the ceremony of inveſting the new emperor was performing, the enemy mounted the ſouth walls, which were defended only by 200 men; and the ſouth gate being at the ſame time abandoned, the whole army broke in. They were oppoſed, however, by Hu-ſye-hu; who, with 1000 ſoldiers, continued to fight with amazing intrepidity In the mean time Shew-fu, ſeeing every thing irreparably loſt, lodged the ſeal of the empire in a houſe; and then cauſing ſheaves of ſtraw to be ſet round it, ordered it to be ſet on fire as ſoon as he was dead. After giving this order he hanged himſelf, and his commands were exe-

32
Siege of Juning-fu.

33
Unhappy fate of the emperor.

34 Diſſolution of the Kin empire.

cuted by his domeſtics. Hu-ſye-hu, who ſtill continued fighting with great bravery, no ſooner heard of the tragical death of the emperor, than he drowned himſelf in the river Ju; as did alſo 500 of his moſt reſolute ſoldiers. The ſame day the new emperor, Cheng-lin, was ſlain in a tumult; and thus an end was put to the dominion of the Kin Tartars in China.

35 War between the Song and the Moguls.

The empire of China was now to be ſhared between the Song, or ſouthern Chineſe, and the Moguls. It had been agreed upon, that the province of Honan ſhould be delivered up to the Song as ſoon as the war was finiſhed. But they, without waiting for the expiration of the term, or giving Oktay notice of their proceedings, introduced their troops into Kay-fong-fu, Lo-yang, and other conſiderable cities. On this the Mogul general reſolved to attack them; and repaſſing the Whang-ho, cut in pieces part of the garriſon of Lo-yang, while they were out in ſearch of proviſions. The garriſon of Kay-fong-fu likewiſe abandoned that place; and the Song emperor degraded the officers who had been guilty of thoſe irregularities, ſending ambaſſadors to Oktay, at the ſame time, to deſire a continuance of the peace. What Oktay's anſwer was we are not told, but the event ſhowed that he was not well pleaſed; for, in 1235, he ordered his ſecond ſon Prince Kotovan, and his general Chahay, to attack the Song in Se-chwen, while others marched towards the borders of Kyang-nan.

In 1236. the Moguls made great progreſs in the province of Huquang, where they took ſeveral cities, and put vaſt numbers to the ſword. This year they introduced paper or ſilk money, which had formerly been uſed by Chang-tſong, ſixth emperor of the Kin. Prince Kotovan forced the paſſages into the diſtrict of Hang-chong-fu in the province of Shenſi, which he entered with an army of 500,000 men. Here a terrible battle was fought between the vaſt army of the Moguls and the Chineſe troops, who had been driven from the paſſages they defended. The latter conſiſted only of 10,000 horſe and foot, who were almoſt entirely cut off; and the Moguls loſt ſuch a number of men, that the blood is ſaid to have run for two leagues together. After this victory the Moguls entered Se-chwen, which they almoſt entirely reduced, committing ſuch barbarities, that, in one city, 40,000 people choſe rather to put an end to their own lives than ſubmit to ſuch cruel conquerors.

36 Dreadful engagement.

In 1237, the Moguls received a conſiderable check before the city of Gantong in Kyang-nan, the ſiege of which they were obliged to raiſe with loſs. In 1238, they beſieged Lu-chuw, another city in the ſame province. They ſurrounded it with a rampart of earth and a double ditch; but the Chineſe general ordered their intrenchments to be filled with immenſe quantities of herbs ſteeped in oil, and then ſet on fire, while he ſhot ſtones upon them from a tower ſeven ſtories high. At the ſame time a vigorous ſally was made; and the Mogul army being thrown into the utmoſt diſorder, were obliged finally to abandon the ſiege, and retire northwards.

In 1239, theſe barbarians were oppoſed by a general called Meng-kong, with great ſucceſs; who, this and the following year, gained great honour by his exploits. While he lived, the Moguls were never able to make any conſiderable progreſs; but his death, in 1246, proved of the greateſt detriment to the Chineſe affairs: and ſoon after, the Tartars renewed the war with more vigour and ſucceſs than ever. In 1255, they re-entered the province of Se-chwen; but ſtill met with vigorous oppoſition in this quarter, becauſe the Chineſe took care to have Se-chwen furniſhed with good troops and generals. Though they were always beaten, being greatly inferior in number to their enemies, yet they generally retook the cities the Moguls had reduced, as the latter were commonly obliged to withdraw for want of proviſions and forage. In 1259 they undertook the ſiege of Ho-chew, a ſtrong city to the weſt of Peking, defended by Vang-kyen, a very able officer, who commanded a numerous garriſon. The ſiege continued from the month of February till Auguſt; during which time the Moguls loſt an immenſe number of men. On the 10th of Auguſt they made a general aſſault in the night. They mounted the walls before the governor had intelligence; but were ſoon attacked by him with the utmoſt fury. The Mogul emperor, Meng-ko, himſelf came to the ſcalade; but his preſence was not ſufficient to overcome the valour of Vang-kyen. At the ſame time the ſcaling-ladders of the Moguls were blown down by a ſtorm; upon which a terrible ſlaughter enſued, and amongſt the reſt fell the emperor himſelf. Upon this diſaſter the Mogul generals agreed to raiſe the ſiege, and retired towards Shen-ſi.

37 Siege of Ho-chew;

38 Moguls defeated, and their emperor killed;

On the death of Meng-ko, Hupilay, or Kublay Khan, who ſucceeded him, laid ſiege to Vu-chang-fu, a city not far diſtant from the capital of the Song empire.

At this the emperor being greatly alarmed, diſtributed immenſe ſums among his troops; and, having raiſed a formidable army, marched to the relief of Vu-chang-fu. Unfortunately the command of this army was committed to the care of Kya-tſe-tau, a man without either courage or experience in war. He was beſides very vain and vindictive in his temper; often uſing the beſt officers ill, and entirely overlooking their merit, which cauſed many of them to go over to the Moguls. The ſiege of Vu-chang-fu was commenced, and had continued a conſiderable time, when Kya-tſe-tau, afraid of its being loſt, and at the ſame time not daring to take any effectual ſtep for its relief, made propoſals of peace. A treaty was accordingly concluded, by which Kya-tſe-tau engaged to pay an annual tribute of about 50,000l. in ſilver and as much in ſilk; acknowledging likewiſe the ſovereignty of the Moguls over the Song empire. In conſequence of this treaty, the Moguls retreated after the boundaries of the two empires had been fixed, and repaſſed the Kyang; but 170 of them having ſtaid on the other ſide of the river, were put to death by Kya-tſe-tau.

39 Treachery of a Chineſe miniſter.

This wicked miniſter totally concealed from the emperor his having made ſuch a ſhameful treaty with the Moguls; and the 170 ſoldiers maſſacred by his order, gave occaſion to a report that the enemy had been defeated; ſo that the Song court believed that they had been compelled to retreat by the ſuperior valour and wiſdom of Kya-tſe-tau. This proved the ruin of the empire; for, in 1260, the Mogul emperor ſent Hauking to the Chineſe court to execute the treaty according to the terms agreed on with Kya-tſe-tau.

The miniſter, dreading the arrival of this envoy, impriſoned him near Nanking; and took all poſſible care that neither Hupilay, nor Li-tſong the Chineſe emperor, ſhould ever hear any thing of him.

It was impoſſible ſuch unparalleled conduct could fail to produce a new war. Hupilay's courtiers inceſſantly preſſed him to revenge himſelf on the Song for their treacherous behaviour; and he ſoon publiſhed a manifeſto againſt them, which was followed by a renewal of hoſtilities in 1268. The Mogul army amounted to 300,000 men; but notwithſtanding their numbers, little progreſs was made till the year 1271. Syan-yang and Fan-ching, cities in the province of Se-chew, had been beſieged for a long time ineffectually; but this year an *Igur* lord adviſed Hupilay to ſend for ſeveral of thoſe engineers out of the weſt, who knew how to caſt ſtones of 150 pounds weight out of their engines, which made holes of ſeven or eight feet wide in the ſtrongeſt walls. Two of theſe engineers were accordingly ſent for; and after giving a ſpecimen of their art before Hupilay, were ſent to the army in 1272. In the beginning of 1273 they planted their engines againſt the city of Fan-ching, and preſently made a breach in the walls. After a bloody conflict the ſuburbs were taken; and ſoon after the Moguls made themſelves maſters of the walls and gates of the city.

40 Deſperate conflict.

Nevertheleſs, a Chineſe officer, with only 100 ſoldiers, reſolved to fight from ſtreet to ſtreet. This he did for a long time with the greateſt obſtinacy, killing vaſt numbers of the Moguls; and both parties are ſaid to have been ſo much overcome with thirſt, that they drank human blood to quench it. The Chineſe ſet fire to the houſes, that the great beams, falling down, might embarraſs the way of their purſuers; but at laſt, being quite wearied out, and filled with deſpair, they put an end to their own lives. After the taking of Fan-ching, all the materials which had ſerved at the ſiege were tranſported to Seyenyang. The two engineers poſted themſelves againſt a wooden retrenchment raiſed on the ramparts. This they quickly demoliſhed; and the beſieged were ſo intimidated by the noiſe and havock made by the ſtones caſt from theſe terrible engines, that they immediately ſurrendered.

In 1274, Pe-yen, an officer of great valour, and endowed with many other good qualities, was promoted to the command of the Mogul army. His firſt exploits were the taking of two ſtrong cities; after which he paſſed the great river Ky-ang, defeated the Song army, and laid ſiege to Vu-chang-fu. This city was ſoon intimidated into a ſurrender; and Pe-yen, by reſtraining the barbarity of his ſoldiers, whom he would not allow to hurt any body, ſoon gained the hearts of the Chineſe ſo much, that ſeveral cities ſurrendered to him on the firſt ſummons. In the mean time the treacherous Kya-tſe-tau, who was ſent to oppoſe Pe-yen, was not aſhamed to propoſe peace on the terms he had formerly concluded with Hupilay; but theſe being rejected, he was obliged at length to come to an engagement. In this he was defeated, and Pe-yen continued his conqueſts with great rapidity. Having taken the city of Nanking, and ſome others, he marched towards Hang-chew-fu, the capital of the Song empire.

41 Chineſe empreſs ſubmits.

Peace was now again propoſed, but rejected by the Mogul general; and at laſt the empreſs was conſtrained to put herſelf, with her ſon, then an infant, into the hands of Pe-yen, who immediately ſent them to Hupilay.

The ſubmiſſion of the empreſs did not yet put an end to the war. Many of the chief officers ſwore to do their utmoſt to reſcue her from the hands of her enemies. In conſequence of this reſolution they diſtributed their money among the ſoldiers, and ſoon got together an army of 40,000 men. This army attacked the city where the young emperor Kong-tſong was lodged, but without ſucceſs; after which, and ſeveral other vain attempts, they raiſed one of his brothers to the throne, who then took upon him the name of Twon-tſong. He was but nine years of age when he was raiſed to the imperial dignity, and enjoyed it but a very ſhort time. In 1277 he was in great danger of periſhing, by reaſon of the ſhip on board which he then was being caſt away. The poor prince fell into the water, and was taken up half dead with the fright. A great part of his troops periſhed at that time, and he ſoon after made offers of ſubmiſſion to Hupilay. Theſe, however, were not accepted; for, in 1278, the unhappy Twon-tſong was obliged to retire into a little deſert iſland on the coaſt of Quang-tong, where he died in the 11th year of his age.

42 Diſſolution of the Song empire.

Notwithſtanding the progreſs of the Moguls, vaſt territories ſtill remained to be ſubdued before they could become maſters of all the Chineſe empire. On the death of Twon-tſong, therefore, the mandarins raiſed to the throne his brother, named Te-ping, at that time but eight years of age. His army conſiſted of no fewer than 200,000 men; but being utterly void of diſcipline, and entirely ignorant of the art of war, they were defeated by 20,000 Mogul troops. Nor was the fleet more ſucceſsful; for being put in confuſion by that of the Moguls, and the emperor in danger of falling into their hands, one of the officers taking him on his ſhoulders, jumped with him into the ſea, where they were both drowned. Moſt of the mandarins followed this example, as did alſo the empreſs and miniſter, all the ladies and maids of honour, and multitudes of others, inſomuch that 100,000 people are thought to have periſhed on that day. Thus ended the Chineſe race of emperors; and the Mogul dynaſty, known by the name of *Ywen*, commenced.

43 Reign of Hupilay.

Though no race of men that ever exiſted were more remarkable for cruelty and barbarity than the Moguls; yet it doth not appear that the emperors of the Ywen dynaſty were in any reſpect worſe than their predeceſſors. On the contrary, Hupilay, by the Chineſe called *Shi-tſu*, found the way of reconciling the people to his government, and even of endearing himſelf to them ſo much, that the reign of his family is to this day ſtyled by the Chineſe *the wiſe government*. This he accompliſhed by keeping as cloſe as poſſible to their ancient laws and cuſtoms, by his mild and juſt government, and by his regard for their learned men. He was indeed aſhamed of the ignorance and barbarity of his Mogul ſubjects, when compared with the Chineſe. The whole knowledge of the former was ſummed up in their ſkill in managing their arms and horſes, being perfectly deſtitute of every art or ſcience, or even of the knowledge of letters. In 1269, he had cauſed the Mogul characters to be contrived. In 1280, he cauſed ſome mathematicians ſearch for the ſource of the river Whang-ho, which at that time was unknown to the Chineſe themſelves. In four months time they arrived in the country where it riſes, and made a map of it, which they preſented to his majeſty. The ſame year a treatiſe on aſtronomy was publiſhed by his order; and, in 1282, he ordered the learned men to repair from all parts of the empire, to examine the ſtate of literature, and take meaſures for its advancement.

At his firſt acceſſion to the crown he fixed his reſidence at Tay-ywen-fu, the capital of Shen ſi; but thought proper afterwards to remove it to Peking. Here, being informed that the barks which brought to court the tribute of the ſouthern provinces, or carried on the trade of the empire, were obliged to come by ſea, and often ſuffered ſhipwreck, he cauſed that celebrated canal to be made, which is at preſent one of the wonders of the Chineſe empire, being 300 leagues in length. By this canal above 9000 imperial barks tranſport with eaſe, and at ſmall expence, the tribute of grain, rice, ſilk, &c. which is annually paid to the court. In the third year of his reign Shi-tſu formed a deſign of reducing the iſlands of Japan, and the kingdoms of Tonquin and Cochin-china. Both theſe enterpriſes ended unfortunately, but the firſt remarkably ſo; for of 100,000 perſons employed in it, only four or five eſcaped with the melancholy news of the deſtruction of the reſt, who all periſhed by ſhipwreck. Shi-tſu reigned 15 years, died in the 80th year of his age, and was ſucceeded by his grandſon.

44 Moguls driven out.

The throne continued in the Ywen family to the year 1367, when Shun-ti, the laſt of that dynaſty, was driven out by a Chineſe named Chu. During this period the Tartars had become enervated by long proſperity; and the Chineſe had been rouſed into valour by their ſubjection. Shun-ti, the reigning prince, was quite ſunk in ſloth and debauchery; and the empire, beſides, was oppreſſed by a wicked miniſter named *Ama*.

45 Exploits of Chu.

In June 1355, Chu, a Chineſe of mean extraction, and head of a ſmall party, ſet out from How-chew, paſſed the Kyang, and took Tayping. He then aſſociated himſelf with ſome other malcontents, at the head of whom he reduced the town of Tu-chew, in Kyangnan. Soon after he made himſelf maſter of Nanking, having defeated the Moguls who came to its relief. In December 1356, he was able to raiſe 100,000 men, at the head of whom he took the city of U-chew, in the eaſt borders of Quang-ſi; and here, aſſembling his generals, it was reſolved neither to commit ſlaughter nor to plunder. The moſt formidable enemy he had to deal with was *Chen yew-lyang*, ſtyled "emperor of the Han." This man being grieved at the progreſs made by Chu, equipped a fleet, and raiſed a formidable army, in order to reduce Nan-chang fu, a city of Kyang-ſi, which his antagoniſt had made himſelf maſter of. The governor, however, found means to inform Chu of his danger; upon which that chief cauſed a fleet to be fitted out at Nanking, in which he embarked 200,000 ſoldiers. As ſoon as Chen-yew-lyang was informed of his enemy's approach, he raiſed the ſiege of Nan chang-fu, and gave orders for attacking Chu's naval force. An engagement enſued between a part of the fleets, in which Chu proved victorious; and next day, all the ſquadrons having joined in order to come to a general engagement, Chu gained a ſecond victory, and burnt 100 of the enemy's veſſels. A third and fourth engagement happened, in both which Chu gained the victory; and in the laſt, Chen-yew-lyang himſelf was killed, his ſon taken priſoner, and his generals obliged to ſurrender themſelves, with all their forces and veſſels.

46 He is proclaimed king of U.

In January 1364, Chu's generals propoſed to have him proclaimed emperor; but this he declined, and at firſt contented himſelf with the title of king of *U*. In February he made himſelf maſter of Vu-chang-fu, capital of Hu-quang: where, with his uſual humanity, he relieved thoſe in diſtreſs, encouraged the literati, and would allow his troops neither to plunder nor deſtroy. This wiſe conduct procured him an eaſy conqueſt both of Kyang ſi and Hu-quang. The Chineſe ſubmitted to him in crowds, and profeſſed the greateſt veneration and reſpect for his perſon and government.

All this time Shun ti, with an unaccountable negligence, never thought of exerting himſelf againſt Chu, but continued to employ his forces againſt the rebels who had taken up arms in various parts of the empire; ſo that Chu found himſelf in a condition to aſſume the title of emperor.

47 Becomes emperor of China.

This he choſe to do at Nanking on the firſt day of the year 1368. After this his troops entered the province of Honan, which they preſently reduced. In the third month, Chu, who had now taken the title of *Hong-vu* or *Tay tſu*, reduced the fortreſs of Tong-quan; after which his troops entered Pecheli from Honan on the one ſide, and Shang-tong on the other. Here his generals defeated and killed one of Shun-ti's officers; after which they took the city of Tong-chew, and then prepared to attack the capital, from which they were now but 12 miles diſtant. On their approach the emperor fled with all his family beyond the great wall, and thus put an end to the dynaſty of Ywen.

48 Moguls driven beyond the deſert.

In 1370 he died, and was ſucceeded by his ſon, whom the ſucceſſor of Hong-vu drove beyond the Kobi or Great Deſert, which ſeparates China from Tartary. They continued their incurſions, however, for many years; nor did they ceaſe their attemps till 1583, when vaſt numbers of them were cut in pieces by the Chineſe troops.

49 China again conquered by the Tartars.

The 21ſt dynaſty of Chineſe emperors, founded in 1368 by Chu, continued till the year 1644, when they were again expelled by the Tartars. The laſt Chineſe emperor was named Whay-tſong, and aſcended the throne in 1628. He was a great lover of the ſciences, and a favourer of the Chriſtians; though much addicted to the ſuperſtitions of the Bonzes. He found himſelf engaged in a war with the Tartars, and a number of rebels in different provinces. That he might more effectually ſuppreſs the latter, he reſolved to make peace with the former; and for that end ſent one of his generals, named *Ywen*, into Tartary, at the head of an army, with full power to negociate a peace; but that traitor made one upon ſuch ſhameful terms, that the emperor refuſed to ratify it. Ywen, in order to oblige his maſter to comply with the terms made by himſelf, poiſoned his beſt and moſt faithful general, named *Mau-ven-long*: and then deſired the Tartars to march directly to Peking, by a road different from that which he took with his army. This they accordingly did, and laid ſiege to the capital.

Ywen was ordered to come to its relief; but, on his arrival, was put to the torture and ſtrangled; of which the Tartars were no ſooner informed, than they raiſed the ſiege, and returned to their own country. In 1636, the rebels above mentioned compoſed four great armies, commanded by as many generals; which, however, were ſoon reduced to two, commanded by Li and Chang. Theſe agreed to divide the empire between them; Chang taking the weſtern provinces, and Li the eaſtern ones. The latter ſeized on part of Shen-ſi, and then of Honan, whoſe capital, named *Kay-fong-fu*, he laid ſiege to, but was repulſed with loſs. He renewed it ſix months after, but without ſucceſs; the beſieged chooſing rather to feed on human fleſh than ſurrender. The imperial forces coming ſoon after to its aſſiſtance, the general made no doubt of being able to deſtroy the rebels at once, by breaking down the banks of the Yellow river; but unfortunately the rebels eſcaped to the mountains, while the city was quite overflowed, and 300,000 of the inhabitants periſhed.

50 Unhappy fate of the emperor and his family.

After this diſaſter, Li marched into the provinces of Shen-ſi and Honan; where he put to death all the mandarins, exacted great ſums from the officers in place, and ſhowed no favour to any but the populace, whom he freed from all taxes: by this means he drew ſo many to his intereſt, that he thought himſelf ſtrong enough to aſſume the title of emperor. He next advanced towards the capital, which, though well garriſoned, was divided into factions. Li had taken care to introduce beforehand a number of his men in diſguiſe: and by theſe the gates were opened to him the third day after his arrival. He entered the city in triumph at the head of 300,000 men, whilſt the emperor kept himſelf ſhut up in his palace, buſied only with his ſuperſtitions. It was not long, however, before he found himſelf betrayed; and, under the greateſt conſternation, made an effort to get out of the palace, attended by about 600 of his guards. He was ſtill more ſurpriſed to ſee himſelf treacherouſly abandoned by them, and deprived of all hopes of eſcaping the inſults of his ſubjects. Upon this, preferring death to the diſgrace of falling alive into their hands, he immediately retired with his empreſs, whom he tenderly loved, and the princeſs her daughter, into a private part of the garden. His grief was ſo great that he was not able to utter a word; but ſhe ſoon underſtood his meaning, and, after a few ſilent embraces, hanged herſelf on a tree in a ſilken ſtring. Her huſband ſtaid only to write theſe words on the border of his veſt: "I have been baſely deſerted by my ſubjects; do what you will with me, but ſpare my people." He then cut off the young princeſs's head with one ſtroke of his ſcymitar, and hanged himſelf on another tree, in the 17th year of his reign, and 36th of his age. His prime miniſter, queens, and eunuchs, followed his example; and thus ended the Chineſe monarchy, to give place to that of the Tartars, which hath continued ever ſince.

It was ſome time before the body of the unfortunate monarch was found. At laſt it was brought before the rebel Li, and by him uſed with the utmoſt indignity; after which he cauſed two of Whay-tſong's ſons, and all his miniſters, to be beheaded; but his eldeſt ſon happily eſcaped by flight. The whole empire ſubmitted peaceably to the uſurper, except Prince U-ſan-ghey, who commanded the imperial forces in the province of Lyau-tong. This brave prince, finding himſelf unable to cope with the uſurper, invited the Tartars to his aſſiſtance; and Tſong-te their king immediately joined him with an army of 80,000 men. Upon this the uſurper marched directly to Peking; but not thinking himſelf ſafe there, plundered and burnt the palace, and then fled with the immenſe treaſure he had got. What became of him afterwards we are not told: but the young Tartar monarch was immediately declared emperor of China, his father Tſong-te having died almoſt as ſoon as he ſet his foot on that empire.

The new emperor, named *Shun-chi*, or *Xun chi*, began his reign with rewarding U-ſan-ghey, by conferring upon him the title of king; and aſſigned him the city of Si-gnan-fu, capital of Shen-ſi, for his reſidence. This, however, did not hinder U-ſan-ghey from repenting of his error in calling in the Tartars, or, as he himſelf uſed to phraſe it, "in ſending for lions to drive away dogs." In 1674, he formed a very ſtrong alliance againſt them, and had probably prevailed if his allies had been faithful; but they treacherouſly deſerted him one after another: which ſo affected him, that he died ſoon after. In 1681 Hong-wha, ſon to U-ſan-ghey, who continued his efforts againſt the Tartars, was reduced to ſuch ſtraits that he put an end to his own life.

52 Empire totally reduced.

During this ſpace, there had been ſome reſiſtance made to the Tartars in many of the provinces. Two princes of Chineſe extraction had at different times been proclaimed emperors; but both of them were overcome and put to death. In 1682, the whole 15 provinces were ſo effectually ſubdued, that the emperor Kang-hi, ſucceſſor to Shun-chi, determined to viſit his native dominions of Tartary. He was accompanied by an army of 70,000 men, and continued for ſome months taking the diverſion of hunting. This he continued to do for ſome years; and in his journeys took Father Verbeiſt along with him; by which means we have a better deſcription of theſe countries than could poſſibly have been otherwiſe obtained.

52 Chriſtianity firſt encouraged and then perſecuted.

This prince was a great encourager of learning and of the Chriſtian religon; in favour of which laſt he publiſhed a decree, dated in 1692. In 1716, however, he revived ſome obſolete laws againſt the Chriſtians; nor could the Jeſuits with all their art preſerve the footing they had got in China. The cauſes of this alteration in his reſolution are, by the miſſionaries, ſaid to have been the ſlanders of the mandarins; but, from the known character of the Jeſuits, it will be readily believed, that there was ſomething more at bottom. This emperor died in 1722, and was ſucceeded by his ſon Yon-ching; who not only gave no encouragement to the miſſionaries, but perſecuted all Chriſtians of whatever denomination, not excepting even thoſe of the imperial race. At the beginning of his reign he baniſhed all the Jeſuits into the city of Canton, and in 1732 they were baniſhed from thence into Ma-kau, a little iſland inhabited by the Portugueſe, but ſubject to China. He died in 1736: but though the Jeſuits entertained great hopes from his ſucceſſor, we have not heard that they have yet met with any ſucceſs.

Thus we have given an account of the moſt memorable tranſactions recorded in the Chineſe hiſtory. It now remains only to deſcribe the preſent ſtate of the empire and its inhabitants, according to the beſt and lateſt accounts.

53
Climate, ſoil, and produce.

The climate as well as the ſoil of this extenſive empire is very different in different parts; ſevere cold being often felt in the northern provinces, while the inhabitants of the ſouthern ones are ſcarce able to bear the heat. In general, however, the air is accounted wholeſome, and the inhabitants live to a great age.—The northern and weſtern provinces have many mountains, which in the latter are cultivated, but in the north are barren, rocky, and incapable of improvement. On the mountains of Chenſi, Honan, Canton, and Fokin, are many foreſts, abounding with tall, ſtraight trees, of different kinds, fit for building, and particularly adapted for maſts and ſhip timber. Theſe are uſed by the emperor in his private buildings; and from theſe foreſts enormous trunks are ſometimes tranſported to the diſtance of more than 300 leagues. Other mountains contain quickſilver, iron, tin, copper, gold, and ſilver. Formerly theſe laſt were not allowed to be opened, leſt the people ſhould thereby be induced to neglect the natural richneſs of the ſoil: and it is certain, that, in the 15th century, the emperor cauſed a mine of precious ſtones to be ſhut, which had been opened by a private perſon. Of late, however, the Chineſe are leſs ſcrupulous, and a great trade in gold is carried on by them. Many extravagant fables are told by the Chineſe of their mountains, particularly of one in Chenſi which throws out flames, and produces violent tempeſts, whenever any one beats a drum or plays on a muſical inſtrument near it. In the province of Fokien is a mountain, the whole of which is an idol, or ſtatue of the God Fo. This natural coloſſus, for it appears not have been the work of art, is of ſuch an enormous ſize, that each of its eyes is ſeveral miles in circumference, and its noſe extends ſome leagues.

54
Lakes and rivers.

China has ſeveral large lakes; the principal one is that named Poyang-hou, in the province of Kiang-ſi. It is formed by the confluence of four large rivers; extends near 100 leagues in length; and, like the ſea, its waters are raiſed into tempeſtuous waves. The empire is watered by an immenſe number of rivers of different ſizes, of which two are purticularly celebrated, viz. the *Tang-tſe-kiang*, or *ſon of the ſea*, and *Hoang-ho*, or the *yellow river*. The former riſes in the province of Yun-nan, and paſſing through Hou-quang and Kiang-nan, falls into the eaſtern ocean, after a courſe of 1200 miles, oppoſite to the iſland of Tſon-ming, which is formed by the ſand accumulated at its mouth. This river is of immenſe ſize, being half a league broad at Nanking, which is near 100 miles from its mouth. The navigation is dangerous, ſo that great numbers of veſſels are loſt on it. It runs with a rapid current, forming ſeveral iſlands in its courſe, which are again carried off and new ones formed in different places, when the river is ſwelled by the torrents from the mountains. Theſe iſlands, while they remain, are very uſeful; producing great quantities of reeds ten or twelve feet high, which are uſed in all the neighbouring countries for fuel. The Hoang-ho, or Yellow river, has its name from the yellow colour given it by the clay and ſand waſhed down in the time of rain. It riſes in the mountains which border the province of Te-tchuen on the weſt, and after a courſe of near 600 leagues, diſcharges itſelf into the eaſtern ſea not far from the mouth of the Kiang. It is very broad and rapid, but ſo ſhallow that it is ſcarce navigable. It is very liable to inundations, often overflowing its banks and deſtroying whole villages. For this reaſon it has been found neceſſary to confine it in ſeveral places by long and ſtrong dykes; which yet do not entirely anſwer the purpoſe. The people of Honan, therefore, whoſe land is exceedingly low, have ſurrounded moſt of their cities with ſtrong ramparts of earth faced with turf, at the diſtance of three furlongs.

55
Canals.

The Chineſe have been at great pains to turn their lakes and rivers to the advantage of commerce, by promoting an inland navigation. One of their principal works for this purpoſe, is the celebrated canal reaching from Canton to Peking, and forming a communication between the ſouthern and northern provinces. This canal extends through no leſs a ſpace than 600 leagues; but its navigation is interrupted in one place by a mountain, where paſſengers are obliged to travel 10 or 12 leagues over land. A number of other canals are met with in this and other provinces; moſt of which have been executed by the induſtry of the inhabitants of different cities and towns, in order to promote their communication with the various parts of the empire. M. Groſier remarks, that, in theſe works, the Chineſe have "ſurmounted obſtacles that perhaps would have diſcouraged any other people: ſuch, for example, is part of a canal which conducts from *Chao-king* to *Ning-po*." Near theſe cities there are two canals, the waters of which do not communicate, and which differ ten or twelve feet in their level. To render this place paſſable for boats, the Chineſe have conſtructed a double glacis, of large ſtones, or rather two inclined planes, which unite as an acute angle at their upper extremity, and extend on each ſide to the ſurface of the water. If the bark is in the lower canal, they puſh it up the plane of the firſt glacis by means of ſeveral capſtanes, until it is raiſed to the angle, when by its own weight it glides down the ſecond glacis, and precipitates itſelf into the water of the higher canal with the velocity of an arrow. It is aſtoniſhing that theſe barks, which are generally very long and heavily loaden, never burſt aſunder when they are balanced on this acute angle; however, we never hear of any accident of this kind happening in the paſſage. It is true, they take the precaution of uſing for their keels a kind of wood which is exceedingly hard, and proper for reſiſting the violence of ſuch an effort.

56
Remarkable river which partly ſinks under ground.

The following remarkable phenomenon in a Chineſe river is related by Father le Couteux, a French miſſionary. "Some leagues above the village Che-pai (ſays he), the river becomes conſiderably ſmaller, although none of its waters flow into any other channel; and, eight or nine leagues below, it reſumes its former breadth, without receiving any additional ſupply, excepting what it gets from a few ſmall rivulets, which are almoſt dry during the greater part of the year. Oppoſite to Che-pai it is ſo much diminiſhed, that, excepting one channel, which is not very broad, I have paſſed and repaſſed it ſeveral times by the help of a common

mon pole. I was always ſurpriſed to find this river ſo narrow and ſhallow in that place; but I never thought of inquiring into the cauſe of it, until the loſs of a bark belonging to a Chriſtian family afforded me an opportunity. In that place where the river diminiſhes almoſt of a ſudden, it flows with great impetuoſity; and where it reſumes its former breadth it is equally rapid. At the ſixth moon, when the water was high and the wind ſtrong, the bark I have mentioned arriving above Che-pai, was driven on a ſand-bank; for between theſe two places the river is full of moveable ſands, which are continually ſhifting their ſituation. The maſter of the boat dropped his anchor, until the wind ſhould abate, and permit him to continue his voyage; but a violent vortex of moveable ſand, which was caſt up from the bottom of the river, laid the bark on its ſide; a ſecond vortex ſucceeded; then a third; and afterwards a fourth, which ſhattered the bark to pieces. When I arrived at the place where this bark had been loſt, the weather was mild and ſerene; I perceived eddies in the current everywhere around, which abſorbed, and carried to the bottom of the river whatever floated on the ſurface; and I obſerved at the ſame time, that the ſand was thrown violently up with a vortical motion. Above theſe eddies the water was rapid, but without any fall; and in the place below, where the river reſumes its uſual courſe, no eddies are to be ſeen, but the ſand is thrown up in the ſame violent manner; and in ſome places there are water-falls and a kind of ſmall iſlands ſcattered at ſome diſtance from one another. Theſe iſlands which appear above the ſurface of the water, are not ſolid earth, but conſiſt of branches of trees, roots, and herbs collected together. I was told that theſe boughs roſe up from the water, and that no one knew the place from whence they came. I was informed, that theſe maſſes, which were 40 or 50 feet in extent on that ſide on which we paſſed, were immoveable, and fixed in the bottom of the river; that it was dangerous to approach them, becauſe the water formed whirlpools everywhere around them; that, however, when the river was very low, the fiſhermen ſometimes ventured to collect the buſhes that floated on its ſurface, and which they uſed for fuel. I am of opinion, that, at the place of the river which is above Che-pai, the water falls into deep pits, from whence it forces up the ſand with that vortical motion; and that it flows under-ground to the other place, eight or nine leagues below, where it carries with it all the boughs, weeds, and roots, which it waſhes down in its courſe, and thus forms thoſe iſlands which appear above its ſurface. We know there are ſome rivers that loſe themſelves entirely, or in part, in the bowels of the earth, and which afterwards ariſe in ſome other place; but I believe there never was one known to loſe part of its water below its own channel, and again to recover it at the diſtance of ſome leagues."

57
Why China is ſubject to famines, notwithſtanding its fertility.

It has already been ſaid, that China is, in general, a fertile country; and indeed all travellers agree in this reſpect, and make encomiums on the extent and beauty of its plains. So careful are the huſbandmen of this empire to loſe none of their ground, that neither incloſure, hedge, nor ditch, nay, ſcarce a ſingle tree, are ever to be met with. In ſeveral places the land yields two crops a-year; and even in the interval between the harveſts the people ſow ſeveral kinds of pulſe and ſmall grain. The plains of the northern provinces yield wheat; thoſe of the ſouthern, rice, becauſe the country is low and covered with water. Notwithſtanding all this fertility, however, the inhabitants are much more frequently afflicted with famine than thoſe of the European nations, though the countries of Europe produce much leſs than China. For this two cauſes are aſſigned. 1. The deſtruction of the riſing crops by drought, hail, inundations, locuſts, &c. in which caſe China cannot like the European countries be ſupplied by importation. This is evident by conſidering how it is ſituated with regard to other nations. On the north are the Mogul Tartars, a lazy and indolent race, who ſubſiſt principally on the fleſh of their flocks; ſowing only a little millet for their own uſe. The province of Leatong, which lies to the north-eaſt, is indeed extremely fertile, but too far diſtant from the capital and centre of the empire to ſupply it with proviſions; and beſides, all carriage is impracticable but in the winter, when great quantities of game, and fiſh, preſerved in ice, are ſent thither. No corn is brought from Corea to China; and though the Japan iſlands are only three or four days ſailing from the Chineſe provinces of Kiang-nan and Che-kyang, yet no attempt was ever made to obtain proviſions from thence; whether it be that the Japaneſe have nothing to ſpare, or on account of the inſults offered by theſe iſlanders to foreign merchants. Formoſa lies oppoſite to the province of Fo-kien; but ſo far is that iſland from being able to ſupply any thing, that in a time of ſcarcity it requires a ſupply from China itſelf. The province of Canton is alſo bounded by the ſea, and has nothing on the ſouth but iſlands and remote countries. One year, when rice was exceedingly ſcarce there, the emperor ſent for F. Parranin, a Jeſuit miſſionary, and aſked him if the city of Macao could not furniſh Canton with rice until the ſupply he had ordered from other provinces ſhould arrive: but was informed that Macao had neither rice, corn, fruit, herbs, nor flocks; and that it generally got from China what was neceſſary for its ſubſiſtence.—The only method, therefore, the Chineſe can take to guard againſt famines ariſing from theſe cauſes, is to erect granaries and public magazines in every province and moſt of the principal cities of the empire. This has at all times been a principal object of care to the public miniſters; but though this mode of relief ſtill takes place in theory, ſo many ceremonies are to be gone through before any ſupply can be drawn from thoſe public repoſitories, that it ſeldom arrives ſeaſonably at the places where it is wanted; and thus numbers of unhappy wretches periſh for want. 2. Another cauſe of the ſcarcity of grain in this empire, is the prodigious conſumpt of it in the compoſition of wines, and a ſpirituous liquor called *rack*. But though government is well apprized that this is one of the principal ſources of famine throughout the empire, it never employed means ſufficient to prevent it. Proclamations indeed have frequently been iſſued, prohibiting the diſtillation of rack; and the appointed officers will viſit the ſtill-houſes and deſtroy the furnaces if nothing is given them; but on ſlipping ſome money into their hands, they ſhut their eyes, and go ſomewhere

where elſe to receive another bribe. When the mandarin himſelf goes about, however, theſe diſtillers do not eſcape quite ſo eaſily, the workmen being whipped and impriſoned, after which they are obliged to carry a kind of collar called the *Cangue*; the maſters are likewiſe obliged to change their habitations and conceal themſelves for a ſhort time, after which they generally reſume their operations. It is impoſſible, however, that any method of this kind can prove effectual in ſuppreſſing theſe manufactories while the liquors themſelves are allowed to be ſold publicly; and againſt this there is no law throughout the empire. Our author, however, juſtly obſerves, that in caſe of a prohibition of this kind, the grandees would be obliged to deny themſelves the uſe of theſe luxuries, which would be too great a ſacrifice for the good of the empire.

58 Immenſe population. The population of China is ſo great, in compariſon with that of the European countries, that the accounts of it have generally been treated as fabulous by the weſtern nations; but by an accurate inveſtigation of ſome Chineſe records concerning the number of perſons liable to taxation throughout the empire, M. Groſier has ſhowed that it cannot be leſs than 200 millions. For this extraordinary population he aſſigns the following cauſes. 1. The ſtrict obſervance of filial duty throughout the empire, and the prerogatives of fraternity, which make a ſon the moſt valuable property of a father. 2. The infamy attached to the memory of thoſe who die without children. 3. The univerſal cuſtom by which the marriage of children becomes the principal concern of the parents. 4. The honours beſtowed by the ſtate on thoſe widows who do not marry a ſecond time. 5. Frequent adoptions, which prevent families from becoming extinct. 6. The return of wealth to its original ſtock by the diſinheriting of daughters. 7. The retirement of wives, which renders them more complaiſant to their huſbands, ſaves them from a number of accidents when big with child, and conſtrains them to employ themſelves in the care of their children. 8. The marriage of ſoldiers. 9. The fixed ſtate of taxes; which being always laid upon lands, never fall but indirectly on the trader and mechanic. 10. The ſmall number of ſailors and travellers. 11. To theſe may be added the great number of people who reſide in China only by intervals; the profound peace which the empire enjoys; the frugal and laborious manner in which the great live; the little attention that is paid to the vain and ridiculous prejudice of marrying below one's rank; the ancient policy of giving diſtinction to men and not to families, by attaching nobility only to employments and talents, without ſuffering it to become hereditary. And, 12. laſtly, A decency of public manners, and a total ignorance of ſcandalous intrigues and gallantry.

Extravagant, however, and almoſt incredible as this account of the population of China may appear to ſome, we have very high and reſpectable authority for believing that it is much below the truth. Whether the cauſes of this phenomenon, as above enumerated by M. Groſier, be the only ones aſſignable, it is certain that the immenſe population of this country amounted to 333,000,000 at the time when Sir George Staunton* viſited it in the capacity of ſecretary to the Britiſh plenipotentiary, as appears from the following eſtimate of the population of each province, made by Chow-ta-zhin, and taken from his official documents. In 1793.

59 Population of the different provinces.

Provinces.		Population.
Pe-che-lee,		38,000,000
Kiang-nan, two provinces,		32,000,000
Kiang-ſee,		19,000,000
Tche-kiang,		21,000,000
Fo-chen,		15,000,000
Hou-pe,	Houquang,	14,000,000
Hou-nan,		13,000,000
Ho-nan,		25,000,000
Shan-tung,		24,000,000
Shan-ſee,		27,000,000
Shen-ſee,		18,000,000
Kan-ſou,		12,000,000
Se-chuen,		27,000,000
Canton,		21,000,000
Quang-ſee,		10,000,000
Yu-nan,		8,000,000
Koei-cheou,		9,000,000
		333,000,000

This prodigious ſum total may exceed the belief of thoſe who are only accuſtomed to calculate from analogy, not recollecting that China cannot have its population reduced by thoſe fertile cauſes, *war* and *debauchery*, the former deſtroying mankind by thouſands, and the latter rendering them unproductive.

60 Unlimited authority of the emperor. The government of China, according to the Abbé Groſier, is purely patriarchal. The emperor is more unlimited in his authority than any other potentate on earth; no ſentence of death, pronounced by any of the tribunals, can be executed without his conſent, and every verdict in civil affairs is ſubject to be reviſed by him; nor can any determination be of force until it has been confirmed by the emperor: and, on the contrary, whatever ſentence he paſſes is executed without delay; his edicts are reſpected throughout the empire as if they came from a divinity; he alone has the diſpoſal of all offices, nor is there any ſuch thing as the purchaſe of places in China; merit, real or ſuppoſed, raiſes to an office, and rank is attached to it only. Even the ſucceſſion to the throne is not altogether hereditary. "The emperor of China has a power of chooſing his own ſucceſſor without conſulting any of his nobility; and can ſelect one not only from among his own children, but even from the body of his people; and there have been ſeveral inſtances of his making uſe of this right: and he has even a power of altering the ſucceſſion after it has once been fixed, in caſe the perſon pitched upon does not behave towards him with proper reſpect. The emperor can alſo prevent the princes of the blood from exerciſing the title, with which, according to the conſtitution of the empire, they are inveſted. They may, indeed, notwithſtanding this, poſſeſs their hereditary dignity; in which caſe they are allowed a revenue proportioned to their high birth, as well as a palace, officers, and

a court; but they have neither influence nor power, and their authority is lower than that of the meaneſt mandarin.

61 Mandarins of different claſſes.

The mandarins are of two claſſes, viz. thoſe of letters, and the inferior ſort, ſtyled mandarins of arms. The latter by no means enjoy the ſame conſideration with the former ſort; indeed in China the literati are highly honoured, and to their influence M. Groſier ſuppoſes that we may in a great meaſure aſcribe the mildneſs and equity of the government; though he thinks that the balance may incline rather too much in their favour. Several degrees, anſwering to thoſe of bachelor, licentiate, and doctor, muſt be paſſed through before one can attain to the dignity of a mandarin of letters; though ſometimes, by the favour of the emperor, it is conferred on thoſe who have attained only the two firſt degrees: but even the perſons who have gone through all the three, enjoy at firſt only the government of a city of the ſecond or third claſs. When ſeveral vacancies happen in the government of cities, the emperor invites to court a correſponding number of the literati, whoſe names are written down in a liſt. The names of the vacant governments are then put into a box, raiſed ſo high that the candidates are able only to reach it with their hands; after which they draw in their turns, and each is appointed governor of the city whoſe name he has drawn.

There are eight orders of theſe mandarins in China. 1. The *calao*, from whom are choſen the miniſters of ſtate, the preſidents of the ſupreme courts, and all the ſuperior officers among the militia. The chief of this order preſides alſo in the emperor's council, and enjoys a great ſhare of his confidence. 2. The *te-hioſe*, or man of acknowledged ability, is a title beſtowed upon every mandarin of the ſecond rank; and from theſe are ſelected the viceroys and preſidents of the ſupreme council in the different provinces. 3. The *tchong tchueo*, or ſcool of mandarins, act as ſecretaries to the emperor. 4. *Y-tchuen-tao*. Theſe keep in repair the harbours, royal lodging houſes, and barks which belong to the emperor, unleſs particularly engaged in ſome other office by his order. 5. The *ting-pi-tao* have the inſpection of the troops. 6. The *tun-tien-hao* have the care of the highways. 7. the *ho-tao* ſuperintend the rivers. 8. The *hai-tao* inſpect the ſea-coaſts.

Thus the whole adminiſtration of the Chineſe empire is intruſted to the mandarins of letters; and the homage paid by the common people to every mandarin in office, almoſt equals that paid to the emperor himſelf. This indeed flows from the nature of their government. In China it is a received opinion that the emperor is the father of the whole empire; that the governor of a province is the father of that province; and that the mandarin who is governor of a city is alſo the father of that city. This idea is productive of the higheſt reſpect and ſubmiſſion, which is not at all leſſened by their great number; for though the mandarins of letters amount to more than 14,000, the ſame reſpect is paid to every one of them.

The mandarins of arms are never indulged with any ſhare in the government of the ſtate; however, to attain to this dignity, it is alſo neceſſary to paſs through the degrees of bachelor, licentiate, and doctor of arms. The accompliſhments neceſſary for a mandarin of arms are, ſtrength of body, with agility and readineſs in performing the various military exerciſes, and comprehending the orders requiſite for the profeſſion of arms; an examination on theſe ſubjects muſt be undergone before the candidate can attain the wiſhed-for dignity.

62 Tribunal of the mandarins of arms.

The mandarins of arms have tribunals, the members of which are ſelected from among their chiefs; and among theſe they reckon princes, counts, and dukes; for all theſe dignities, or ſomething equivalent to them, are met with in China. The principal of theſe tribunals is held at Peking, and conſiſts of five claſſes, 1. The mandarins of the rear-guard, called *heou-fou*, 2. Of the left wing, or *tſa-fou*. 3. Of the right wing, or *yeou-feou*. 4. Of the advanced main-guard, or *te-hong-fou*. 5. Of the advanced guard, or *tſien-fou*. Theſe five tribunals are ſubordinate to one named *iong-tching-fou*; the preſident of which is one of the great lords of the empire, whoſe authority extends over all the military men in the empire. By his high dignity be could render himſelf formidable even to the emperor; but to prevent this inconvenience, he has for his aſſeſſor a mandarin of letters, who enjoys the title and exerciſes the function of ſuperintendant of arms. He muſt alſo take the advice of two inſpectors who are named by the emperor; and when theſe four have agreed upon any meaſure, their reſolution muſt ſtill be ſubmitted to the reviſal of an higher court named *ping-pou*, which is entirely of a civil nature. The chief of theſe mandarins is a general of courſe, whoſe powers are equivalent to thoſe of our commanders in chief; and below him are other mandarins who act as ſubordinate officers.

Theſe two claſſes of mandarins compoſe what is called the nobility of China: but as we have already hinted, their office is not hereditary; the emperor alone continues or confers it. They have the privilege of remonſtrating to the emperor, either as individuals or in a body, upon any part of his conduct which appears contrary to the intereſt of the empire. Theſe remonſtrances are ſeldom ill received, though the ſovereign complies with them only when he himſelf thinks proper. The number of literary mandarins in China is computed at upwards of 14,000; and thoſe of arms at 18,000; the former, however, are conſidered as the principal body in the empire; and this preference is thought to damp the military ardour of the nation in general, and to be one cauſe of that weakneſs in war for which the Chineſe are remarkable.

63 Military force.

The armies of this empire are proportioned to its vaſt extent and population; being computed in time of peace at more than 700,000. Their pay amounts to about two-pence half-penny and a meaſure of rice per day, though ſome of them have double pay, and the pay of a horſeman is double that of a foot ſoldier; the emperor furniſhes a horſe, and the horſeman receives two meaſures of ſmall beans for his daily ſubſiſtence; the arrears of the army being punctually paid up every three months.

The arms of a horſeman are, a helmet, cuiraſs, lance, and ſabre; thoſe of a foot ſoldier are a pike and ſabre; ſome have fuſees, and others bows and arrows. All theſe are carefully inſpected at every review; and if any of them are found in the leaſt ruſted, or otherwiſe in bad condition, the poſſeſſor is inſtantly puniſhed; if a Chineſe, with 30 or 40 blows of a ſtick; or if a Tartar, with as many laſhes.

64 ſe of fire- ms loſt d revi- d. Though the uſe of gun-powder is certainly very ancient in China, it appears to have been afterwards totally loſt, at leaſt fire-arms ſeem to have been almoſt entirely unknown ſome centuries ago. Three or four cannon were to be ſeen at that time about the gates of Nanking; but not a ſingle perſon in China knew how to make uſe of them; ſo that, in 1621, when the city of Macao made a preſent of three pieces of artillery to the emperor, it was found neceſſary alſo to ſend three men to load them. The utility of theſe weapons was quickly perceived by the execution which the three cannon did againſt the Tartars, at that time advanced as far as the great wall. When the invaders threatened to return, the mandarins of arms gave it as their opinion, that cannons were the beſt arms they could make uſe of againſt them. They were then taught the art of caſting cannon by F. Adam Schaal and Verbieſt, two Jeſuit miſſionaries, and their artillery was increaſed to the number of 320 pieces; at the ſame time that they were inſtructed in the method of fortifying towns, and conſtructing fortreſſes and other buildings according to the rules of modern architecture.

The beſt ſoldiers in China are procured from the three northern provinces, the others being ſeldom called forth, but allowed to remain at peace with their families; indeed there is not often occaſion for exerting their military talents, unleſs it be in the quelling of an inſurrection, when a mandarin or governor uſually accompanies them. They march in a very tumultuous manner, but want neither ſkill nor agility in performing their different evolutions. They, in general, handle a ſabre well, and ſhoot very dexterouſly with bows and arrows. There are in China more than 2000 places of arms; and through the different provinces there are diſperſed about 3000 towers or caſtles, all of them defended by garriſons. Soldiers continually mount guard there; and on the firſt appearance of tumult, the neareſt centinel makes a ſignal from the top of the tower, by hoiſting a flag in the day-time, or lighting a torch in the night; when the neigbouring garriſons immediately repair to the place where their preſence is neceſſary.

65 count of e great all. The principal defence of the empire againſt a foreign enemy is the great wall which ſeparates China from Tartary, extending more than 1500 miles in length, and of ſuch a thickneſs that ſix horſemen may eaſily ride abreaſt upon it. It is flanked with towers two bow-ſhots diſtant from one another; and it is ſaid that a third of the able-bodied men in the empire were employed in conſtructing it. The workmen were ordered, under pain of death, to place the materials ſo cloſely, that not the leaſt entrance might be afforded for any inſtrument of iron; and thus the work was conſtructed with ſuch ſolidity, that it is ſtill almoſt entire, though 2000 years have elapſed ſince it was conſtructed. This extraordinary work is carried on not only through the low lands and valleys, but over hills and mountains; the height of one of which was computed by F. Verbieſt at 1236 feet above the level of the ſpot where he ſtood. According to F. Martini it begins at the gulf of Lea-tong, and reaches to the mountains near the city of Kin on the Yellow river; between which places it meets with no interruption except to the north of the city of Suen in the province of Pecheli, where it is interrupted by a ridge of hideous and inacceſſible mountains, to which it is cloſely united. It is likewiſe interrupted by the river Hoang-ho; but for others of an inferior ſize, arches have been conſtructed, through which the water paſſes freely. Mr Bell informs us, that it is carried acroſs rivers, and over the tops of the higheſt hills, without the leaſt interruption, keeping nearly along that circular range of barren rocks which incloſes the country; and, after running about 1200 miles, ends in impaſſable mountains and ſandy deſerts. The foundation conſiſts of large blocks of ſtone laid in mortar; but all the reſt is of brick. The whole is ſo ſtrong and well built, that it ſcarcely needs any repairs; and, in the dry climate in which it ſtands, may remain in the ſame condition for many ages. When carried over ſteep rocks, where no horſe can paſs, it is about 15 or 20 feet high, but when running through a valley, or croſſing a river, it is about 30 feet high, with ſquare towers and embraſures at equal diſtances. The top is flat, and paved with cut ſtone; and where it riſes over a rock or eminence, there is an aſcent made by an eaſy ſtone ſtair. "This wall (our author adds) was begun and completely finiſhed in the ſhort ſpace of five years; and it is reported, that the labourers ſtood ſo cloſe for many miles, that they could hand the materials from one to another. This ſeems the more probable, as the rugged rocks among which it is built muſt have prevented all uſe of carriages; and neither clay for making bricks, nor any kind of cement are to be found among them."

To this account of the moſt aſtoniſhing production of human labour and induſtry to be met with on the face of the earth, we may add, that if to its prodigious length of 1500 miles, we aſſume as true, the probable conjecture that its dimenſions throughout are nearly the ſame as where it was croſſed by the Britiſh embaſſy, it contains materials more than ſufficient to erect all the dwelling houſes in England and Scotland, even admitting their number to be 1,800,000, and each to contain 2000 cubic feet of maſonry. In this calculation the huge projecting maſſes of ſtone called towers, are not included, which of themſelves would erect a city as large as London. To aſſiſt the conceptions of our readers ſtill farther reſpecting this ſingular and ſtupendous fabric, we ſhall only obſerve, that were its materials converted into a wall 12 feet high and four feet thick, it would poſſeſs ſufficient length to ſurround the globe, at its equatorial circumference.

66 Courts by which the civil government is managed. The whole civil government of China is managed by the following courts. 1. The emperor's grand council, compoſed of all the miniſters of ſtate, preſidents and aſſeſſors of the ſix ſovereign courts, and of three others, to be afterwards mentioned. This is never aſſembled but on affairs of the greateſt importance; the emperor's private council being ſubſtituted to it in all caſes of ſmaller moment. 2. The chief of the other courts furniſhes mandarins for the different provinces, watches over their conduct, keeps a journal of their tranſactions, and informs the emperor of them, who rewards or puniſhes according to the report he gets.

China.

This ſecond tribunal, which may be called a kind of civil inquiſition, is ſubdivided into four others; the firſt entruſted with the care of ſelecting thoſe who, on account of their learning or other good properties, are capable of filling the offices of government; the ſecond appointed to take care of the conduct of the mandarins; the third affixing the ſeals to the different public acts, giving the ſeals to mandarins, and examining thoſe of the different diſpatches; while the fourth inquires into the merit of the grandees of the empire, not excepting the princes of the imperial blood themſelves. The principal ſovereign court to which theſe four laſt are ſubordinate is called *Lii-pou.*

2. *Hou-pou*, or the grand treaſurer, ſuperintends all the finances of the ſtate; is the guardian and protector of the treaſures and dominions of the emperor, keeping an account of his revenues, &c. ſuperintending the management and coining of money, the public magazines, cuſtomhouſes; and, laſtly, keeping an exact regiſter of all the families in the empire. To aſſiſt this court, 14 others are appointed throughout the different provinces of the empire.

3. *Li pou*, or the court of ceremonies. "It is an undoubted fact (ſays M. Groſier), that ceremonies form, in part, the baſe of the Chineſe government. This tribunal therefore takes care to ſupport them, and enforce their obſervance; it inſpects alſo the arts and ſciences. It is conſulted by the emperor when he deſigns to confer particular honours; takes care of the annual ſacrifices offered up by him, and even regulates the entertainments which he gives either to ſtrangers or to his own ſubjects. It alſo receives and entertains foreign ambaſſadors, and preſerves tranquillity among the different religious ſects in the empire. It is aſſiſted by four inferior tribunals.

4. *Ping-pou*, or the tribunal of arms, comprehends in its juriſdiction the whole militia of the empire; inſpecting alſo the fortreſſes, magazines, arſenals, and ſtore-houſes of every kind, as well as the manufactories of arms both offenſive and defenſive; examining and appointing officers of every rank. It is compoſed entirely of mandarins of letters; and the four tribunals depending upon it conſiſt alſo of literati."

5. The *Long pou* is the criminal bench for the whole empire, and is aſſiſted by 14 ſubordinate tribunals.

6. The *cong-pou*, or tribunal of public works, ſurveys and keeps in repair the emperor's palaces, as well as thoſe of the princes and viceroys, and the buildings where the tribunals are held, with the temples, tombs of the ſovereigns, and all public monuments. It has beſides the ſuperintendence of the ſtreets, public highways, bridges, lakes, rivers, and every thing relating either to internal or foreign navigation. Four inferior tribunals aſſiſt in the diſcharge of theſe duties; the firſt drawing the plans of public works; the ſecond directing the work-ſhops in the different cities of the empire; the third ſurveying the cauſeways, roads, bridges, canals &c.; and the fourth taking care of the emperor's palaces, gardens, and orchards, and receiving their produce.

67
Partiality of government towards the Chineſe.

All the tribunals are compoſed, one half of Chineſe, and the other of Tartars; and one of the preſidents of each ſuperior tribunal is always a Tartar born. None of the courts above deſcribed, however, has abſolute authority even in its own juriſdiction: nor can its deciſions be carried into execution without the concurrence of another tribunal, and ſometimes of ſeveral others. The fourth tribunal, for inſtance, has indeed under its juriſdiction the whole troops of the empire; but the payment of them is entruſted with the ſecond; while the ſixth has the care of the arms, tents, chariots, barks, and ſtores neceſſary for military operations; ſo that nothing relative to theſe can be put in execution without the concurrence of all the three tribunals.

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68
Cenſors.

To prevent any unlawful combination among the tribunals, each has its *cenſor* appointed. This is an officer whoſe duty is merely to watch over the proceedings of the court, without deciding upon any thing himſelf. He aſſiſts therefore at all aſſemblies, reviſes all their acts, and without acquainting the court in the leaſt with either his ſentiments or intentions, immediately informs the emperor of what he judges to be amiſs. He likewiſe gives information of the behaviour of the mandarins, either in the public adminiſtration of affairs, or in their private conduct; nay, ſometimes he will not ſcruple to reprimand the emperor for what he ſuppoſes to be erroneous in his conduct.

Theſe cenſors are never removed from their places but in order to be promoted; and thus, holding their offices for life, they have the greater courage to ſpeak out when they obſerve any impropriety or abuſe. Their accuſation is ſufficient to ſet on foot an inquiry, which generally leads to a proof; in which caſe the accuſed is diſcharged from his office, and never held in any eſtimation afterwards. The complaints of the cenſors, however, are referred to the very tribunals againſt whoſe members they complain; though, being afraid of an accuſation themſelves, they very ſeldom paſs ſentence againſt the accuſers.

Beſides all this, the cenſors alſo form a tribunal of their own, named *tou-tche-yven.* Its members have a right of remonſtrating with the emperor, whenever his own intereſt or that of the public renders it neceſſary. They inſpect all lawyers and military men in public employments. "In ſhort (ſays M. Groſier), they are, morally ſpeaking, placed between the prince and the mandarins; between the mandarins and the people; between the people and families; between families and individuals; and they generally unite to the importance of their office incorruptible probity and invincible courage. The ſovereign may, if he proceeds to rigour, take away their lives; but many of them have patiently ſuffered death, rather than betray the cauſe of truth, or wink at abuſes. It is not ſufficient therefore to have got rid of one, they muſt all be treated in the ſame manner; the laſt that might be ſpared would tread in the ſame ſteps with no leſs reſolution than thoſe who went before him. In the annals of no nation do we find an example of ſuch a tribunal, yet it appears to be neceſſary in all without exception. We muſt not, however, imagine, that the privileges of a cenſor give him a right to forget his duty to his ſovereign, or to communicate to the public thoſe remarks which he takes the liberty of making to him: were he only to give the leaſt hint of them to his colleagues, he would be puniſhed with death; and he would ſhare the ſame fate did he, in any of his repreſentations, ſuffer a ſingle word, inconſiſtent with moderation or reſpect, to eſcape him."

69
Two courts peculiar to China.

There are ſtill two other courts in China, both of them peculiar to the empire, which deſerve to be mentioned. The firſt is that of princes; and which, in conformity with its title, is compoſed of princes only. In the regiſters of this tribunal are inſcribed the names of all the children of the imperial family as ſoon as they are born: and to theſe are alſo conſigned the dignities and titles which the emperor confers upon them. This is the only tribunal where the princes can be tried; and here they are abſolved or puniſhed according to the pleaſure of the judges.

The other tribunal is that of hiſtory, called by the Chineſe *han-lin yvan*. It is compoſed of the greateſt geniuſes of the empire, and of men of the moſt profound erudition. Theſe are entruſted with the education of the heir apparent to the throne, and the compilation and arrangement of the general hiſtory of the empire; which laſt part of their office renders them formidable even to the emperor himſelf. From this body the mandarins of the firſt claſs, and the preſidents of the ſupreme claſs, are generally choſen.

70
Filial piety the baſis of all their aws.

The baſis of all the civil laws of the Chineſe is filial piety. Every mandarin, who is a governor either of a province or city, muſt inſtruct the people aſſembled round him twice a month, and recommend to them the obſervance of certain ſalutary rules, which are ſummed up in a few ſhort ſentences, and ſuch as no perſon can ever be ſuppoſed capable of forgetting.

71
Of their marriages.

The Chineſe are allowed only to have one wife, whoſe rank and age muſt be nearly equal to that of their huſbands; but they are allowed to have ſeveral concubines, whom they may admit into their houſes without any formality, after paying the parents a ſum of money, and entering into a written engagement to uſe their daughters well. Theſe concubines, however, are all in ſubjection to the lawful wife; their children are conſidered as hers; they addreſs her as mother, and can give this title to her only. A perſon that has once been married, whether man or woman, may lawfully marry again, but it is then no longer neceſſary to ſtudy equality of age or condition. A man may chooſe his ſecond wife from among his concubines; and, in all caſes, this new marriage requires very few formalities. A widow is abſolute miſtreſs of herſelf, and can neither be compelled by her parents to marry again, nor to continue in a ſtate of widowhood, contrary to her own inclination. Thoſe of moderate rank, however, who have no children, do not enjoy the ſame privilege; as the parents of the former huſband can diſpoſe of her in marriage, not only without her conſent, but without her knowledge. The law authorizes the diſpoſal of them in this manner, in order to indemnify the relations of the deceaſed huſband for the money they may have coſt him. If the wife is left big with child, this cannot take place, until ſhe is delivered; nor can it be done at all if ſhe brings forth a ſon. There are likewiſe two exceptions; 1. when the parents of the widow aſſign her a proper maintenance; and, 2. if the widow embraces a religious life, and becomes a bonzeſſe.

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ivorces, nlawful arriages, c.

Divorces are allowed in China in caſes of adultery, mutual diſlike, incompatibility of tempers, jealouſy, &c. No huſband, however, can put away or ſell his wife until a divorce is legally obtained; and if this regulation be not ſtrictly obſerved, the buyer and ſeller become equally culpable. If a wife, lawfully married, privately withdraws herſelf from her huſband, he may immediately commence an action at law; by the ſentence of which ſhe becomes his ſlave, and he is at liberty to ſell her to whom he pleaſes. On the other hand, if a huſband leaves his wife for three years, ſhe is at liberty, after laying her caſe before the mandarins, to take another huſband; but if ſhe were to anticipate their conſent, ſhe would be liable to a ſevere puniſhment.

Marriage is deemed illegal in China in the following caſes. 1. If the young woman has been betrothed to a young man, and preſents have been given and received by the parents of the intended huſband and wife. 2. If in the room of a beautiful young woman another be ſubſtituted of a diſagreeable figure; or if the daughter of a free man marry his ſlave; or if any one give his ſlave to a free woman, pretending to her parents that he is his ſon or relation. In all theſe caſes the marriage is null and void; and all thoſe who have had any ſhare in making up the match are ſeverely puniſhed.

3. Any mandarin of letters is forbidden to form an alliance with any family reſiding in the province or city of which he is governor.

4. No Chineſe youth can enter into a ſtate of marriage during the time of mourning for his father or mother; and if promiſes have been made before, they ceaſe immediately on that event taking place. After the uſual time of mourning is expired, however, the parents of the intended bride are obliged to write to thoſe of the young man, putting him in mind of his engagement.

5. Marriage is alſo ſuſpended when a family experiences any ſevere misfortune, and even if a near relation were thrown into priſon; though this may be ſet aſide, provided the unfortunate perſon give his conſent.

6. Two brothers cannot marry two ſiſters; nor is a widower at liberty to marry his ſon to the daughter of a widow whom he chooſes for his own wife. A man is alſo forbidden to marry any of his own relations, however diſtant the degree of conſanguinity between them.

In China every father of a family is reſponſible for the conduct of his children, and even of his domeſtics; all thoſe faults being imputed to him which it was his duty to have prevented. Every father has the power of ſelling his ſon, "provided (ſays the law) the ſon has a right of ſelling himſelf." This cuſtom, however, is barely tolerated among the middling and inferior ranks; and all are forbidden to ſell them to comedians, or people of infamous character or very mean ſtations.

In China a ſon remains a minor during the whole lifetime, and is even liable for the debts contracted by his father, thoſe from gaming only excepted. Adoption is authorized by law, and the adopted child immediately enters into all the rights of a lawful ſon; only the law gives a right to the father of making a few diſpoſitions in favour of his real children. The children, however, whether adopted or not, cannot ſucceed to the dignity or titles of their father, though they may to his eſtate. The emperor alone can confer honours ; and even then they muſt be reſigned when the perſon attains the age of 70 ; though this reſignation is conſidered as an advice rather than a law. The will of a father cannot be ſet aſide in China on account of any informality ; nor can any mother in this empire make a will.

Though the Chineſe laws authorize ſlavery, yet the power of the maſter extends only to thoſe matters which concern his own ſervice ; and he would be puniſhed with death for taking advantage of his power to debauch the wife of his ſlave.

By the laws of China huſbandmen are exempt from the payment of taxes after they have begun to till the earth to the beginning of harveſt.

73 Criminal code.

It appears, from recent information reſpecting many intereſting particulars relating to China, that the utmoſt attention ſeems to have been paid to the different degrees of enormity attached to thoſe actions of men which are denominated criminal. The code of laws is pronounced the reverſe of ſanguinary, and it is affirmed by competent judges, that if the practice in all reſpects coincided with the theory, few nations could boaſt of a milder or more effectual adminiſtration of juſtice. But while they do not conſider the crime of pilfering a few ſmall pieces of money as of equal enormity with the ſhedding of human blood, yet they pay too little attention to the three different circumſtances under which that action may exiſt ; either as accidental, unintentional as to the extent of taking away life, or maliciouſly premeditated. Even foreigners who have the misfortune to kill a Chineſe, however caſually it may be done, have been puniſhed in the very ſame manner as a traitor or deliberate aſſaſſin. As foreigners intending to reſide in China may be at a loſs to determine how, when, and by what various means their lives may be endangered, the following abſtract of the criminal code of that country may perhaps be beneficial to ſome of our readers.

1. A man who kills another on the ſuppoſition of theft, ſhall be ſtrangled, according to the law of homicide committed in an affray.

2. A man who fires at another with a muſket, and kills him, ſhall be beheaded, as in caſes of wilful murder. If the ſufferer be wounded, but not mortally, the offender ſhall be ſent into exile.

3. A man who puts to death a criminal who had been apprehended, and made no reſiſtance, ſhall be ſtrangled, according to the law againſt homicide committed in an affray.

4. A man who falſely accuſes an innocent perſon of theft (in caſes of greateſt criminality) is guilty of a capital offence ; in all other caſes the offenders, whether principals or acceſſaries, ſhall be ſent into exile.

5. A man who wounds another unintentionally, ſhall be tried according to the law reſpecting blows given in an affray, and the puniſhment rendered more or leſs ſevere, according to the degree of injury ſuſtained.

6. A man who, intoxicated with liquor, commits outrages againſt the laws, ſhall be exiled to a deſert country, there to remain in a ſtate of ſervitude.

For this abſtract we are indebted to the humane interference of the ſupercargoes of the Eaſt India Company, on account of the diſagreeable diſputes which frequently took place with the Chineſe government, owing to accidents of the moſt trivial nature, which the people ſometimes met with from the Britiſh in the port of Canton.

The blood of a traitor is ſuppoſed to be contaminated in this country to the 10th generation, although the law in general is conceived to be ſatisfied with implicating the neareſt male relatives in the guilt of the actual perpetrator of the crime, but with commutation of puniſhment from death to exile. It appears to us, that nothing can be conceived more tyrannical than a law which pretends to inflict puniſhment on an innocent perſon, ſince no man can be a traitor, merely from the circumſtance of his being the relation of one, and the abſurdity of ſuppoſing that a non-exiſtence is capable of committing a crime, muſt be obvious to every man. The fifth law in the forementioned extract is peculiarly cruel and unjuſt, ſince it ſubjects a man to different degrees of puniſhment, according to the different effects which thoſe actions may produce. It is with a degree of national pride that we turn from this cruel, abſurd ſpecimen of Chineſe legiſlation, this ſtrange judicial thermometer, if we may be allowed the expreſſion, to the nice diſcriminations which are made by the laws of our own country reſpecting the ſhedding of blood, the gradations of guilt attending which we have already mentioned, and which are diſtinguiſhed by the appropriate names of *manſlaughter, culpable homicide*, and *wilful murder*.

The denunciations of Moſes, it may be ſaid, have ſome reſemblance to this gothic code of the Chineſe, eſpecially when he declares that the Deity would viſit the iniquities of the fathers upon the children to the third and fourth generation. It is not our province in this account of China, to write an apology for Moſes in this particular inſtance, although it muſt be granted that he had a moſt obſtinate and refractory race of beings to govern, and to preſerve a becoming degree of order and ſubordination among them. He might therefore have nothing more in view than political expedience, an opinion which we are the more encouraged to entertain, when we find the prophet Ezekiel reprobating the idea of making the innocent ſuffer for the guilty, in the following beautiful paſſage. "What mean ye that ye uſe this proverb concerning the land of Iſrael, ſaying, the fathers have eaten ſour grapes, and the children's teeth are ſet on edge ? As I live, ſaith the Lord, ye ſhall not have occaſion any more to uſe this proverb in Iſrael. Behold all ſouls are mine ; as the ſoul of the father, ſo alſo the ſoul of the ſon, is mine. The ſoul that ſinneth, *it* ſhall die. The ſon ſhall not bear the iniquity of the father, neither ſhall the father bear the iniquity of the ſon : the righteouſneſs of the righteous ſhall be upon *him*, and the wickedneſs of the wicked ſhall be upon *him*."

In criminal matters every perſon accuſed muſt be examined before five or ſix tribunals ; and whoſe inquiries are directed not only againſt him, but againſt his accuſer, and the witneſſes that appear in the cauſe. He is, however, obliged to remain in priſon during the proceſs : "but (ſays M. Groſier) the Chineſe priſons are not horrible dungeons like thoſe of ſo many other nations ; they are ſpacious, and have even a degree of convenience. One of the mandarins is obliged to inſpect them frequently; and this he does with the greater punctuality, as he muſt anſwer for thoſe who are ſick. He is obliged to ſee them properly treated, to ſend for phyſicians, and to ſupply them with medicines at the emperor's expence. If any of them dies, he muſt inform the emperor, who perhaps will order ſome of the higher mandarins to examine whether the former has diſcharged his duty faithfully or not.

74 Method of inflicting the baſtinado.

The ſlighteſt puniſhment in China is the baſtinado; and the number of blows is to be determined by the degree of the offender's guilt. Twenty is the loweſt number; and in this caſe the puniſhment is conſidered as having nothing infamous in it, but being only a ſimple paternal correction. In this way the emperor ſometimes orders it to be inflicted on his courtiers; which does not prevent them from being afterwards received into favour, and as much reſpected as before. Every mandarin may inflict the baſtinado when any one forgets to ſalute him, or when he ſits in judgment in public. The inſtrument of correction is called *pan-tſee*, and is a piece of bamboo a little flatted, broad at the bottom, and poliſhed at the upper extremity, in order to manage it more eaſily with the hand. When the puniſhment is to be inflicted, the magiſtrate ſits gravely behind a table, having on it a bag filled with ſmall ſticks, while a number of petty officers ſtand around him, each furniſhed with theſe *pan-tſees*, and waiting only for his ſignal to make uſe of them. The mandarin then takes out one of the little ſticks contained in the bag, and throws it into the hall of audience. On this the culprit is ſeized and ſtretched out with his belly towards the ground; his breeches are pulled down to his heels, and an athletic domeſtic applies five ſmart blows with his *pan-tſee*. If the judge draws another ſmall ſtick from the bag, another officer ſucceeds, and beſtows five more blows; and ſo on until the judge makes no more ſignals. When the puniſhment is over, the criminal muſt throw himſelf on his knees, incline his body three times to the earth, and thank the judge for the care he takes of his education.

75 The *cangue*, or wooden collar.

For faults of a higher nature, the carrying of a wooden collar, called by the Portugueſe the *cangue*, is inflicted. This machine is compoſed of two pieces of wood hollowed out in the middle, which, when put together, leave ſufficient room for the neck. Theſe are laid upon the ſhoulders of the criminal, and joined together in ſuch a manner, that he can neither ſee his feet nor put his hands to his mouth; ſo that he is incapable of eating without the aſſiſtance of another. This diſagreeable burden he is obliged to carry day and night; its weight is from 50 to 200 pounds, according to the enormity of the crime, to which the time of carrying it is alſo proportioned. For robbery, breaking the peace, or diſturbing a family, or being a notorious gambler, it is generally carried three months. During all this time the criminal is not allowed to take ſhelter in his own houſe, but is ſtationed for a certain ſpace of time, either in ſome public ſquare, the gate of a city or temple, or perhaps even of the tribunal where he was condemned. On the expiration of his term of puniſhment, he is again brought before the judge, who exhorts him in a friendly manner to amend; and after giving him 20 ſound blows diſcharges him.

76 Baniſhment, &c.

Baniſhment is inflicted for crimes of a nature inferior to homicide, and the duration is often for life, if the criminals be ſent into Tartary. Some culprits are condemned to drag the royal barks for three years, or to be branded in the cheeks with a hot iron, indicating the nature of their tranſgreſſions Robbery between relations is more ſeverely puniſhed than any other; and that is accounted the moſt atrocious where younger brothers or nephews appropriate to themſelves beforehand any part of the ſucceſſion in which they have a right to ſhare with their elder brothers or nephews.

77 Puniſhment of informers againſt parents, &c.

Information againſt a father or mother, grandfather or grandmother, uncle or eldeſt brother, even though the accuſation be juſt, is puniſhed with 100 blows of the pan-tſee and three years baniſhment. If the accuſation be falſe, it is puniſhed with death. Deficiency in proper filial reſpect to a father, mother, grandfather, or grandmother, is puniſhed with 100 blows of the pan-tſee; abuſive language to theſe relations is death by ſtrangling; to ſtrike them is puniſhed by beheading; and if any one preſumes to hurt or maim them, his fleſh is torn from his bones with red-hot pincers, and he is cut into a thouſand pieces. Abuſing an elder brother is puniſhed with 100 blows of the pan-tſee; ſtriking him, with the puniſhment of exile.

78 Capital puniſhments, how inflicted.

Homicide, even though accidental, is puniſhed with death in China. A rope about ſix or ſeven feet in length, with a running nooſe, is thrown over the criminal's head; and a couple of domeſtics belonging to the tribunal pull it ſtrongly in different directions. They then ſuddenly quit it, and in a few moments give a ſecond pull; a third is ſeldom neceſſary to finiſh the buſineſs. Beheading is accounted in China the moſt diſhonourable of all puniſhments, and is reſerved only for deſperate aſſaſſins, or thoſe who commit ſome crime equally atrocious with murder. To be cut in a thouſand pieces is a puniſhment inflicted only upon ſtate criminals or rebellious ſubjects. It is performed by tying the criminal to a poſt, ſcalping the ſkin from the head and pulling it over the eyes. The executioner then tears the fleſh from different parts of the unhappy wretch's body: and never quits this horrible employment till mere fatigue obliges him to give over: the remains of the body are then left to the barbarous ſpectators, who finiſh what he has begun. Though this puniſhment, however, has been inflicted by ſome emperors with all the dreadful circumſtances juſt mentioned, the law orders only the criminal's belly to be opened, his body to be cut into ſeveral pieces, and then thrown into a ditch or river.

The torture, both ordinary and extraordinary, is uſed in China. The former is applied to the hands or feet: for the hands, ſmall pieces of wood are applied diagonally between the fingers of the criminal; his fingers are then tied cloſe with cords, and he is left for ſome time in that painful ſituation. The torture for the feet is ſtill worſe. An inſtrument, conſiſting of three croſs pieces of wood, is provided, that in the middle being fixed, the others moveable. The feet of the criminal are then put into this machine, which ſqueezes them ſo cloſe that the ankle bones become flat. The extraordinary torture conſiſts in making ſmall gaſhes in the body, and then tearing off the ſkin like thongs. It is never applied but for ſome great crime, ſuch as treaſon, or where the criminal's guilt has been clearly proved, and it is neceſſary to make him diſcover his accomplices.

79
M. Groſier's general view of the Chineſe laws.

Notwithſtanding theſe dreadful puniſhments, M. Groſier is at great pains to prove that the laws of the Chineſe, with regard to criminal matters, are extremely mild. "One law (ſays he) will no doubt appear exceedingly ſevere and rigorous; it inflicts the puniſhment of death on thoſe who uſe pearls. Thoſe who read the hiſtory of China will be apt to fall into certain miſtakes reſpecting the penal laws of that nation. Some of its ſovereigns have indulged themſelves in gratifying ſanguinary caprices which were not authorized by the laws, and which have often been confounded with them; but theſe princes are even yet ranked among the number of tyrants, and their names are ſtill abhorred and deteſted throughout the whole empire. The Chineſe, in their criminal procedure, have a great advantage over all other nations: it is almoſt impoſſible that an innocent man ſhould ever become a victim to a falſe accuſation: in ſuch caſes the accuſer and witneſſes are expoſed to too much danger. The ſlowneſs of the proceſs, and the numberleſs reviſions it undergoes, are another ſafeguard for the accuſed. In ſhort, no ſentence of death is ever carried into execution until it has been approved and confirmed by the emperor. A fair copy of the whole proceſs is laid before him; a number of other copies are alſo made out, both in the Chineſe and Tartar languages, which the emperor ſubmits to the examination of a like number of doctors, either Tartars or Chineſe. When the crime is of great enormity, and clearly proved, the emperor writes with his own hand at the bottom of the ſentence, "When you receive this order, let it be executed without delay." In caſes where the crime, though puniſhable by death according to law, is ranked only in the ordinary claſs, the emperor writes at the bottom of the ſentence, "Let the criminal be detained in priſon, and executed in autumn;" that being the ſeaſon in which they are generally executed, and all on the ſame day.

80
Caſes in which crimes may be pardoned.

The emperor of China never ſigns an order for the execution of a criminal till he has prepared himſelf by faſting. Like other monarchs he has the power of giving pardons; but in this reſpect is much more limited than any other. The only caſes in which the Chineſe monarch can remit the puniſhment inflicted by law are, 1. To the ſon of a widow who has not married again; 2. To the heir of an ancient family; 3. The deſcendents of great men or citizens who have deſerved well of their country; and, 4. laſtly, The ſons or grandſons of a mandarin, who has become illuſtrious, and diſtinguiſhed himſelf by faithfully diſcharging the duties of his office. Neither a child, nor a man of very advanced age, can be cited before a tribunal. The ſon of a very aged father and mother is pardoned, if private property or the public peace be not hurt by giving him a pardon; and if the ſons of ſuch a father and mother be all guilty, or accomplices in the ſame crime, the youngeſt is pardoned in order to comfort his parents.

In China the accuſed are always treated with tenderneſs and lenity, being accounted innocent until their guilt be clearly proved; and even then, liberty excepted, they are ſcarce allowed to want for any thing. A jailor is puniſhed who behaves rigorouſly towards his priſoners; and the judges muſt likewiſe anſwer at their peril for any additions to the ſeverity of the law; depoſition being the ſlighteſt puniſhment inflicted upon them.

Subſtitution is ſometimes allowed by the laws of China; ſo that the near relation of a guilty perſon may put himſelf in the criminal's place, provided, however, that the chaſtiſement be ſlight, and the accuſed his ancient friend. The ſons, grandſons, wife, and brothers of a baniſhed Chineſe, are allowed to follow him into exile; and the relations of all perſons are permitted to viſit them in priſons, and to give them every aſſiſtance in their power; to do which good offices they are even encouraged, inſtead of being prevented.

81
Of the cities and their government.

Every city in China is divided into different quarters, each of which is ſubjected to the inſpection of a certain officer, who is anſwerable for whatever paſſes in the places under his juriſdiction. Fathers of families, as we have already obſerved, are anſwerable for the conduct of their children and domeſtics. Neighbours are even obliged to anſwer for one another, and are bound to give every help and aſſiſtance in caſes of robbery, fire, or any accident, eſpecially in the night-time. All the cities are furniſhed with gates, which are barricadoed on the commencement of night. Centinels are alſo poſted at certain diſtances throughout the ſtreets, who ſtop all who walk in the night, and a number of horſemen go round the ramparts for the ſame purpoſe; ſo that it is almoſt impoſſible to elude their vigilance by favour of the darkneſs. A ſtrict watch is alſo kept during the day-time; and all thoſe who give any ſuſpicion by their looks, accent, or behaviour, are immediately carried before a mandarin, and ſometimes even detained until the pleaſure of the governor be known.

Private quarrels do not often happen in China, and it is rare that they are attended with a fatal iſſue. The champions ſometimes decide the quarrel with their fiſts, but moſt frequently refer the caſe to a mandarin, who very often orders them both a ſound drubbing. None but military people are permitted to wear arms in public; and this privilege is extended even to them only during the time of war, or when they accompany a mandarin, mount guard, or attend a review. Proſtitutes are not allowed to remain within the walls of a city, or to keep a houſe of their own even in the ſuburbs. They may, however, lodge in the houſe of another; but that other is accountable for every diſturbance which may happen on their account.

82
Borrowing of money.

In all the Chineſe cities, and even in ſome of their ordinary towns, there is an office where money may be borrowed upon pledges at the common rate of the country; which, however, is no leſs than 30 per cent. Every pledge is marked with a number when left at the office, and muſt be produced when demanded; but it becomes the property of the office if left there a ſingle day longer than the term agreed upon for the payment of the money. The whole tranſaction remains an inviolable ſecret; not even the name of the perſon who leaves the pledge being inquired after.

This mode of procuring a ſupply of money for the exigencies of the moment, has been long known in Britain, and the people who thus lend money on pledges under the ſanction of government, have a moſt exorbitant intereſt, as well as in China; but we are ſorry to add, that it is by no means conducted with ſuch profound ſecrecy. The perſon's name and ſurname who offers a pledge muſt be inſerted in the pawn-broker's books, who is thus enabled to make the tranſaction as public as he pleaſes. Inſtitutions of this nature are no doubt of conſiderable utility to the modeſt poor during the period of embarraſſment; but the monſtrous evils to which they have given riſe are more than ſufficient to counterbalance their advantages. We ſhould deem an open avowal of poverty and want to be infinitely preferable to an application to ſuch a ſink of corruption and extortion, aſſured that genuine diſtreſs will never want a friend among the ſons of benevolence or philanthropy.

83 Of the Chi- eſe roads.

Great attention is paid by the adminiſtration of China to the conveniency of travellers. The roads are generally very broad, all of them paved in the ſouthern provinces, and ſome in the northern; but neither horſes nor carriages are allowed to paſs along theſe. In many places valleys have been filled up, and rocks and mountains cut through, for the purpoſe of making commodious highways, and to preſerve them as nearly as poſſible on a level. They are generally bordered with very lofty trees, and in ſome places with walls eight or ten feet high, to prevent travellers from going into the fields; but openings are left in proper places, which give a paſſage into croſs roads that lead to different villages. Covered ſeats are erected on all the great roads, where travellers may ſhelter themſelves from the inclemency of the weather; temples and pagods are alſo frequent, into which travellers are admitted without ſcruple in the day-time, but often meet with a refuſal in the night. In theſe the mandarins only have a right to reſt themſelves as long as they think proper. There is, however, no want of inns on the great roads, or even the croſs ones in China; but they are ill ſupplied with proviſions; and thoſe who frequent them are even obliged to carry beds along with them to ſleep on, or elſe take up with a plain mat.

Towers are erected on all the roads of this great empire, with watch-boxes on the top, with flag-ſtaffs, for the convenience of ſignals in caſe of any alarm. Theſe towers are ſquare, and generally conſtructed of brick, but ſeldom exceed twelve feet in height. They are built, however, in ſight of one another, and are guarded by ſoldiers, who run with great ſpeed from one to another, carrying letters which concern the emperor. Intelligence of any remarkable event is alſo conveyed by ſignals; and thus the court is informed with ſurpriſing quickneſs of any important matter. Thoſe which are built on any of the roads conducting to court, are furniſhed with battlements, and have alſo very large bells of caſt iron. According to law theſe towers ſhould be only five *lys*, about half a French league, diſtant from one another.

84 Method of conveyance.

There is no public poſt-office in China, though ſeveral private ones have been eſtabliſhed; but the couriers and officers charged with diſpatches for the empire have only a right to make uſe of them. This inconvenience, however, excepted, travellers find conveyance very eaſy from one part of China to another. Great numbers of porters are employed in every city, all of whom are aſſociated under the conduct of a chief, who regulates all their engagements, fixes the price of their labour, receives their hire, and is reſponſible for every thing they carry. When porters are wanted, he furniſhes as many as may be neceſſary, and gives the ſame number of tickets to the traveller; who returns one to each porter when they have conveyed their loads to an appointed place. Theſe tickets are carried back to the chief, who immediately pays them from the money he received in advance. On all the great roads in China there are ſeveral offices of this kind, which have a ſettled correſpondence with others; the travellers therefore have only to carry to one of theſe offices a liſt of ſuch things as they wiſh to have tranſported: this is immediately written down in a book; and though there ſhould be occaſion for two, three, or four hundred porters, they are inſtantly furniſhed. Every thing is weighed before the eyes of their chief, and the hire is fivepence per hundred weight for one day's carriage. An exact regiſter of every thing is kept in the office; the traveller pays the money in advance, after which he has no occaſion to give himſelf any farther trouble; on his arrival at the city he deſigns, his baggage is found at the correſponding office, and every thing is delivered to him with the moſt ſcrupulous exactneſs.

85 Cuſtomhouſes.

The cuſtomhouſes are here regulated by the general police of the country; and according to M. Groſier's account, theſe cuſtomhouſe officers are the moſt civil in the world. They have no concern with any claſs of people but the merchants, whom they take care not to diſtreſs by any rigorous exactions; neither, though they have authority to do ſo, do they ſtop travellers till their baggage is examined, nor do they ever require the ſmalleſt fee from them. Duties are paid either by the piece or the load; and in the former caſe credit is given to the merchant's book without aſking any queſtions. A mandarin is appointed by the viceroy of each province to inſpect the cuſtomhouſes of the whole diſtrict; and the mandarins have alſo the care of the poſt-offices.

86 Money of the empire.

In former times the only money uſed in China was made of ſmall ſhells, but now both ſilver and copper coin are met with. The latter conſiſts of round pieces about nine-tenths of an inch (A) in diameter, with a ſmall ſquare hole in the middle, inſcribed with two Chineſe words on one ſide, and two Tartar ones on the other. The ſilver pieces are valued only by their weight. For the convenience of commerce the metal is therefore caſt into plates of different ſizes: and

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(A) The Chineſe foot is longer by one hundredth part than the French, and the inch is divided into ten parts.

and for want of ſmall coin, a Chineſe always carries about him his ſcales, weights, and a pair of ſciſſars to cut the metal. This operation is performed by putting the ſilver between the ſciſſars, and then knocking them againſt a ſtone till the pieces drop off. In giving of change, however, people have no right to value ſilver by the numerical value of copper, this being entirely regulated by the intrinſic value of the metals. Thus, an ounce of ſilver will ſometimes be worth 1000 copper pieces, and ſometimes only 800; and thus the copper money of China may frequently be ſold for more than it would paſs for in commerce. The emperor would loſe much by this recoinage, were he not the ſole proprietor of all the copper mines in China. It is, however, expreſsly forbidden to employ copper coin in any manufacture where it might be employed as plain copper, and it is alſo forbidden to be ſold for the purpoſe of melting: but, if the price of the metal has not fallen, the infraction of this law is not very ſeverely puniſhed. On the other hand, if the value of unwrought copper exceeds that of the coin, a quantity of the latter is iſſued out to reſtore the equilibrium.

To keep up a conſtant circulation of all the coin in the empire, the Chineſe government are attentive to preſerve an equilibrium between the proportional value of the gold and ſilver; that is, to regulate the intrinſic value of each in ſuch a manner that the poſſeſſor of ſilver may not be afraid to exchange it for copper, nor the poſſeſſor of copper for ſilver. The method uſed for this purpoſe is, when ſilver becomes ſcarce, to make all the payments for ſome time in ſilver; but if copper, to make them all for ſome time in that metal only.

87 Of the Chineſe commerce.

The commerce of China is under the inſpection of the tribunal of finances; but on this ſubject the Chineſe entertain an opinion quite different from that of the Europeans. Commerce, according to them, is only uſeful as far as it eaſes the people of their ſuperfluities, and procures them neceſſaries. For this reaſon they conſider even that which is carried on at Canton as prejudicial to the intereſt of the empire. "They take from us (ſay the Chineſe) our ſilks, teas, and procelain: the price of theſe articles is raiſed through all the provinces: ſuch a trade therefore cannot be beneficial. The money brought us by Europeans, and the high-priced baubles that accompany it, are mere ſuperfluities to ſuch a ſtate as ours. We have no occaſion for more bullion than what may be neceſſary to anſwer the exigencies of government, and to ſupply the relative wants of individuals. It was ſaid by Kouan-tſe, two thouſand years ago, That the money introduced does not enrich a kingdom in any other way than as it is introduced by commerce. No commerce can be advantageous long, but that which conſiſts in a mutual exchange of things neceſſary or uſeful. That trade, whether carried on by barter or money, which has for its object the importing of articles that tend to the gratification of pride, luxury, or curioſity, always ſuppoſes the exiſtence of luxury: but luxury, which is an abundance of ſuperfluities among certain claſſes of people, ſuppoſes the want of neceſſaries among a great many others. The more horſes the rich put to their carriages, the greater will be the number of thoſe who are obliged to walk on foot; the larger and more magnificent their houſes are, ſo much the more confined and wretched muſt thoſe of the poor be; and the more their tables are covered with a variety of diſhes, the more muſt the number of thoſe increaſe who are reduced to the neceſſity of feeding upon plain rice. Men, united by ſociety in a large and populous kingdom, can employ their induſtry, talents, and economy, to no better purpoſe than to provide neceſſaries for all, and procure convenience for ſome."

88 Hiſtory of the trade with Ruſſia.

The only commerce conſidered by the Chineſe as advantageous to their empire, is that with Ruſſia and Tartary; by which they are ſupplied with thoſe furs ſo neceſſary in the northern provinces. The diſputes concerning the limits of the reſpective empires of Ruſſia and China ſeem to have paved the way to this commerce. Theſe diſputes were ſettled by treaty on the 27th of Auguſt 1689, under the reign of Ivan and Peter Alexiowitz. The chief of the embaſſy on the part of Ruſſia was Golovin governor of Siberia; and two Jeſuits were deputed on the part of the emperor of China; and the conferences were held in Latin, with a German in the Ruſſian ambaſſador's train, who was acquainted with that language. By this treaty the Ruſſians obtained a regular and permanent trade with China, which they had long deſired; but in return they yielded up a large territory, beſides the navigation of the river Amour. The firſt intercourſe had taken place in the beginning of the 17th century; at which time a ſmall quantity of Chineſe merchandiſe was procured by ſome Ruſſian merchants from the Kalmuck Tartars. The rapid and profitable ſale of theſe commodites encouraged certain Siberian wayvodes to attempt a direct and open communication with China. For this purpoſe ſeveral deputations were ſent to the emperor; and though they failed of obtaining the grant of a regular commerce, their attempts were attended with ſome conſequences of importance. Thus the Ruſſian merchants were tempted to ſend treaders occaſionally to Peking; by which means a faint connexion was preſerved with that metropolis. This commerce, however, was at laſt interrupted by the commencement of hoſtilities on the river Amour; but after the concluſion of the treaty in 1689, was reſumed with uncommon alacrity on the part of the Ruſſians; and the advantages thence ariſing were found to be ſo conſiderable, that a deſign of enlarging it was formed by Peter the Great. Iſbrand Ides, a native of the duchy of Holſtein, then in the Ruſſian ſervice, was therefore diſpatched to Peking in 1692; by whoſe means the liberty of trade, before confined to individuals, was now extended to caravans. In the mean time, private merchants continued to trade as before, not only with the Chineſe, but alſo at the head quarters of the Mogul Tartars. The camp of theſe roving Tartars, which was generally ſtationed near the confluence of the Orhon and Toula rivers, between the ſouthern frontiers of Siberia and the Mogul deſert, thus became the ſeat of an annual fair. Complaints, however, were ſoon made of the diſorderly behaviour of the Ruſſians; on which the Chineſe monarch threatened to expel them from his dominions entirely, and to allow them neither to trade with the Chineſe nor Moguls. This produced another embaſſy to Peking in 1719, when matters were again adjuſted to the ſatisfaction of both parties. The reconciliation was of no long duration; for the Ruſſians having ſoon renewed their diſorderly behaviour, an order for their expulſion was iſſued in 1722, and all intercourſe between the two nations forbidden. The differences were once more made up in 1727, and a caravan allowed to go to Peking once in three years, provided it conſiſted of no more than a hundred perſons; and that during their ſtay their expences ſhould not, as formerly, be defrayed by the emperor of China. The Ruſſians at the ſame time obtained permiſſion to build a church within the precincts of the caravanſary; and four prieſts were allowed to reſide at Peking for the celebration of divine ſervice; the ſame indulgence being granted to ſome Ruſſian ſcholars, for the purpoſe of learning the Chineſe language, and qualifying themſelves for being interpreters between the two nations. This intercourſe continued till the year 1755; ſince which time no more caravans have been ſent to China. It was firſt interrupted by a miſunderſtanding betwixt the two courts; and though that difference was afterwards made up, no caravans have been ſent ever ſince. The empreſs of Ruſſia, ſenſible that the monopoly of the fur trade (which was entirely confined to the caravans belonging to the crown, and prohibited to individuals) was prejudicial to commerce, gave it up in favour of her ſubjects in 1762; and the centre of commerce betwixt the two nations is now at Kiatka. Here the trade is entirely carried on by barter. The Ruſſians are prohibited from exporting their own coin; finding it more advantageous to take goods in exchange than to receive bullion at the Chineſe ſtandard. The principal exports from Ruſſia are furs of different kinds; the moſt valuable of which are thoſe of ſea otters, beavers, wolves, foxes, martins, ſables, and ermines; the greater part of which are brought from Siberia and the newly diſcovered iſlands; but as they cannot ſupply the demand, there is a neceſſity for importing foreign furs to Peterſburg, which are afterwards ſent to Kiatka. Various kinds of cloth are likewiſe ſent to China, as well as hardware, and live cattle, ſuch as horſes, camels, &c. The exports from China are, raw and manufactured ſilk, cotton, porcelain, rhubarb, muſk, &c. The government of Ruſſia likewiſe reſerves to itſelf the excluſive privilege of purchaſing rhubarb It is brought to Kiatka by ſome Bukharian merchants, who have entered into a contract to ſupply the crown with it in exchange for furs: the exportation of the beſt rhubarb is forbidden under ſevere penalties, but yet is procured in ſufficient quantities, ſometimes by clandeſtinely mixing it with inferior roots, and ſometimes by ſmuggling it directly. Great part of Europe is ſupplied with rhubarb from Ruſſia.

89 nperor's venue. The revenue of the emperor of China amounts to more than 41 millions ſterling; and might eaſily be increaſed, did the ſovereign incline to burden his ſubjects with new impoſitions. When Lord Macartney viſited this vaſt empire in the capacity of his Britannic majeſty's ambaſſador, the revenue of the Chineſe emperor was not leſs than 66 millions ſterling; but it cannot be ſuppoſed that a very large ſhare of this enormous ſum is actually expended by the emperor, after deducting the almoſt incalculable number of ſalaries which it is deſtined to pay, together with a ſtanding army of 1,800,000 men. Yet upon the ſuppoſition that each individual is taxed equally, this enormous ſum will amount to no more than 4s. a head annually, while the ſame analogy applied to Britain will make an individual ſhare amount to 3l. There is reaſon, however, to conclude, that the Chineſe, in the above eſtimate of their ſtanding army, have been rather hyperbolical; for Lord Macartney, from the information communicated by Vang-ta-zin, makes the whole of the expences of government to leave a ſurplus for the uſe of the emperor of 14,043,743l. ſterling, which we preſume would be impoſſible, were their ſtanding army as enormous as ſome of the Chineſe pretend.

Sum total of the revenue,		L. 66,000,000
Civil eſtabliſhment,	L. 1,973,333	
Military ditto	49,982,933	
		51,956,266
Surplus for the emperor,		L. 14,043,734*

The annual expences of government are indeed immenſe, but they are regulated in ſuch a manner as never to be augmented but in caſes of the utmoſt neceſſity. It even happens very often that adminiſtration makes greater ſavings every year. When this happens to be the caſe, the ſurplus ſerves to increaſe the general treaſure of the empire, and prevents the neceſſity of new impoſitions in time of war, or other public calamities. The greater part of the taxes are paid in kind; thoſe, for inſtance, who breed ſilk worms, pay their taxes in ſilk, the huſbandman in grain, the gardeners in fruits, &c. This method, at the ſame time that it is exceedingly convenient for the ſubject, is no way detrimental to the public intereſt. There are numbers of people everywhere in the ſervice of government, who are thus furniſhed with food and clothing; ſo that the commodities collected as taxes are almoſt conſumed in the provinces where they are levied; what remains is ſold for the behoof of the emperor, and the money depoſited in the imperial treaſury. The taxes paid in money ariſe principally from the cuſtoms and ſale of ſalt (which belongs entirely to the emperor), from the duties paid by veſſels entering any port, and from other impoſts on various branches of manufactures. Excepting theſe, the trader ſcarcely contributes any thing to the exigencies of the ſtate, and the mechanic nothing at all; the whole burden of taxation thus falling upon the huſbandman. This burden is regulated in proportion to the extent and fertility of his lands; and the greateſt care has been taken to manage matters ſo, that he may neither be overcharged in the impoſition nor haraſſed in the levying of the duties. "The regiſtering of lands (ſays M. Groſier), ſo often and to no purpoſe projected in France, has been long practiſed in this empire, notwithſtanding its prodigious extent."

90 Of the taxes in China. The levying of taxes in China is as ſimple as the nature of the thing will admit of. The duties levied from towns and villages are carried to cities of the third claſs; then they are conducted to thoſe of the ſecond; then to thoſe of the firſt; and at laſt to the capital. The levying and impoſition of taxes is ſubmitted to the tribunal of finances; and matters are ſo managed, that beſides the conſumption in each diſtrict

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* *Barrow's Travels*, p. 407.

for diſcharging the ordinary expences of government, ſomething is left by way of reſerve for anſwering accidental demands, and to be ready in caſes of neceſſity. This ſum becomes gradually leſs from the capital to cities of the firſt, ſecond, and third claſs. A proper ſtatement of what is paid in the provinces, of what is reſerved in the different cities, or contained in the different treaſuries of the empire, is ſubjected to the examination of the grand tribunal of finances. This reviſes the whole, and keeps an exact account of what is conſumed, and of whatever ſurplus may be left.

91 Of lending money, and deficiencies in paying intereſt.

Lending money upon intereſt has been in uſe in China for about 2000 years. It has often been aboliſhed, and as often eſtabliſhed. The intereſt, as has been already hinted, in no leſs than 30 per cent. and the year is only lunar. A tenth part of this intereſt is paid monthly: and concerning neglects of payment, the following laws have been enacted. "However much the debt may have accumulated by months or years, the principal and intereſt ſhall remain always the ſame. Whoever infringes this law ſhall receive 40 blows of a *pan-tſee;* or an hundred, if he uſes any artifice to add the principal and intereſt together." This law is explained by the following. "Whoever ſhall be convicted before a mandarin of not having paid a month's intereſt, ſhall receive ten blows; twenty for two months, and thirty for three; and in this manner as far as ſixty; that is to ſay, to the ſixth month. The debtor is then obliged to pay principal and intereſt; but thoſe who obtain payment by uſing violence and force are condemned to receive 24 blows."

Many Chineſe writers have endeavoured unſucceſsfully to ſhow why government ſhould allow ſuch exorbitant intereſt to be taken for money; but the moſt ſatisfactory and rational account ſeems to be, that the great intereſt of money prevents the rich from purchaſing much land; as landed eſtates would only embarraſs and impoveriſh them, their produce being ſo much inferior to that of money. The patrimony of a family in China is ſeldom divided: and it never happens there, as in almoſt every other country, that wealth and riches are engroſſed by one part of the nation, while the other poſſeſſes nothing.

92 Agriculture greatly encouraged.

Agriculture is by the Chineſe conſidered as the firſt and moſt honourable of all profeſſions; ſo that in this empire the huſbandman enjoys many and great privileges, while the merchant and mechanic are much leſs eſteemed. He is conſidered as next in dignity to officers of ſtate, from whom indeed they very frequently originate. The ſoldier in China cultivates the ground, and even the prieſts are employed in agriculture, when their convents happen to be endowed with land. From the principle that the emperor is abſolute proprietor of the ſoil, one would imagine that the tenant muſt hold his ſhare of it by a very precarious tenure, yet it is certain that when any man is diſpoſſeſſed, his own culpable conduct is the cauſe. The Chineſe are ſo habituated to conſider a piece of land as their own, while they continue to be punctual in the payment of their rent, that a Portugueſe reſident at Macao, who attempted to raiſe the rent of his tenants, ran the hazard of loſing his life. There are no prodigiouſly overgrown farms in China, no monopolizers of farms, no wholeſale dealers in grain, but every man has it in his power to carry his produce to a free and open market. Part of the crop is allowed to be uſed in diſtillation; but if the harveſt happens to be bad, this operation is prohibited.

93 Ceremon of the em peror tilling the earth wit his own hands.

In China, the tillage of the earth is not only encouraged by law, but alſo by the example of the emperor, who annually tills the earth with his own hands. The beginning of ſpring in China is always reckoned to be in the month of February; but it belongs to the tribunal of mathematics to determine the preciſe day. The tribunal of ceremonies announces it to the emperor by a memorial; in which every thing requiſite to be done by him is mentioned with the moſt ſcrupulous exactneſs. The ſovereign then names 12 of the moſt illuſtrious perſons in his court to accompany him, and to hold the plough after he has performed his part of the ceremony. Among theſe there are always three princes of the blood, and nine preſidents of ſupreme courts; and if any of them are too old and infirm to undergo the fatigue, the ſubſtitutes muſt be authorized by the emperor. The feſtival is preceded by a ſacrifice, which the emperor offers up to *Chang-ti* (the ſupreme God); after which he and his attendants prepare themſelves by three days faſting and continence. Others are appointed by the emperor on the evening before the ceremony, to go and proſtrate themſelves at the ſepulchre of his anceſtors, and to acquaint them, that, on the day following, he intends to celebrate a grand ſacrifice. This is offered upon a ſmall mount a few furlongs diſtant from the city, which, by the indiſpenſable rules of the ceremony, muſt be 50 feet in height. The Chang-ti is invoked by the emperor, who ſacrifices under the title of ſovereign pontiff, and prays for an abundant harveſt in favour of his people. He then deſcends, accompanied by the three princes and nine preſidents who are to put their hands to the plough along with him; the field ſet apart for this purpoſe being at a ſmall diſtance from the mount. Forty labourers are ſelected to yoke the oxen, and to prepare the ſeeds which the emperor is to ſow; and which are of five different kinds, viz. wheat, rice, two kinds of millet, and beans. They are brought to the ſpot in magnificent boxes, carried by perſons of the moſt diſtinguiſhed rank. The emperor then lays hold of the plough, and turns up ſeveral furrows; the princes of the blood do the ſame, and then the preſidents; after which the emperor throws into the furrows the five kinds of ſeeds already mentioned: laſtly, four pieces of cotton cloth, proper for making dreſſes, are diſtributed to each of the labourers, who aſſiſt in yoking the oxen and preparing the ſeeds; and the ſame preſents are made to forty other perſons who have only been ſpectators of the ceremony.

94 Of the pe ſants.

"We muſt not (ſays M. Groſier) judge of the Chineſe peaſants from thoſe of Europe, eſpecially in what relates to the lights acquired by education. Free ſchools are very numerous in every province of China, and even ſome of the villages are not deſtitute of this advantage. The ſons of the poor are there received as readily as thoſe of the rich; their duties and their ſtudies are the ſame; the attention of the maſters is equally divided between them: and from this obſcure ſource talents often ſpring, which afterwards make a conſpicuous figure on the grand ſtage of life. Nothing is more common in China than to ſee the ſon of a peaſant governor of that province in which his father had long toiled in cultivating only a few acres. The father himſelf, if taken from his plough, and elevated to a ſuperior ſphere, might, by reviving the inſtruction he received in his youth, and eſpecially if he be endowed with genius, find himſelf fully competent for his new employment.

95
Groſier's defence of the Chineſe from the charge of murdering and expoſing their children.

The Chineſe have been greatly reproached with the inhuman practice of murdering their children; but though our author cannot deny that they are guilty of this practice, he excuſes them by ſaying, that "the crime when committed in China is commonly owing to the fanaticiſm of idolatry; a fanaticiſm which prevails only among the loweſt of the people. It is either in obedience to the oracle of a bonze, to deliver themſelves from the power of magic ſpells, or to diſcharge a vow, that theſe infatuated wretches precipitate their children into the river: they imagine that, by doing ſo, they make an expiatory ſacrifice to the ſpirit of the river. All nations of antiquity almoſt have diſgraced themſelves by the like horrid practices; but the Chineſe are far from countenancing this barbarity on that account. Beſides, theſe criminal ſacrifices are never practiſed but in certain cantons of China, where the people, blinded by idolatry, are the dupes of prejudice, fanaticiſm, and ſuperſtition.—It often happens alſo, that the bodies of thoſe children which are ſeen floating on the water have not been thrown into it till after their death; and this is likewiſe the caſe with thoſe which are found in the ſtreets, or lying near the public roads. The poverty of the parents ſuggeſts this diſmal reſource, becauſe their children are then buried at the expence of the public. Expoſing of children in public places is a cuſtom tolerated in China; and government employs as much vigilance to have them carried away in the morning, as it beſtows care on their education. This is certainly giving people intimation to expoſe their children in the night-time, and no doubt encourages the practice; but the dictates of humanity are here united to thoſe of ſound policy. No law in China authorizes mutilation: there are indeed eunuchs in the empire, but their number is much leſs than what is generally ſuppoſed to be by Europeans. The greater part of the eunuchs belonging to the emperor and empreſſes have no higher employment than that of ſweeping the courts of juſtice."

96
Gazette of Peking.

Like the capital cities of European kingdoms, Peking, the metropolis of the Chineſe empire, is furniſhed with a gazette, which circulates into the remoteſt provinces, and which is even conſidered by adminiſtration as an eſſential part of the political conſtitution. It is printed daily at Peking, and contains an account of all thoſe objects to which the attention of adminiſtration is directed. In this gazette may be ſeen the names of all thoſe mandarins who are ſtripped of their employments, and the cauſes of their diſgrace; it mentions alſo the names of all thoſe delinquents who are puniſhed with death; of the officers appointed to fill the places of the diſgraced mandarins; the calamities which have afflicted any of the provinces; the relief given by government; and the expences incurred by adminiſtration for the ſubſiſtence of the troops, ſupplying the wants of the people, repairing or erecting public works; and, laſtly, the remonſtrances made to the ſovereign by the ſuperior tribunals, either with regard to his public deciſions or private conduct, and ſometimes even with regard to both. Nothing, however, is contained in this gazette that has not immediately come from the emperor, or been ſubmitted to his inſpection; and immediate death would be the conſequence of inſerting a falſehood in this miniſterial paper.

97
Seals of the emperor, mandarins, &c.

No law or ſentence, as has already been ſaid, is of any force, until the emperor's ſeal has been affixed to it. This is about eight inches ſquare, and is made of fine jaſper, a kind of precious ſtone much eſteemed in China; of which only the emperor is allowed to have a ſeal. Thoſe given to princes as marks of honour are compoſed of gold; the ſeals of the viceroys and great mandarins, of ſilver; while thoſe of inferior mandarins and magiſtrates are made only of lead or copper. The ſize of thoſe ſeals is greater or ſmaller according to the rank their poſſeſſors hold in the tribunals or as mandarins; and when any of them happens to be worn out, intimation muſt be ſent to the next ſuperior tribunal; on which a new one is ſent, and the old one muſt then be delivered up. The commiſſion of every inſpector ſent into the provinces muſt alſo be confirmed by the emperor's ſeal. The duty of theſe officers is to examine into the conduct of governors, magiſtrates, and private individuals; and inſtances are recorded of emperors themſelves aſſuming the office of inſpectors in ſome of the provinces. Theſe officers are not only ſuperior to all the magiſtrates, but even to the viceroys of the provinces themſelves. When a ſuperior magiſtrate behaves ill to an inferior one, the former inſtantly becomes the priſoner of the inſpector, and is ſuſpended from his office until he has cleared himſelf from every imputation laid to his charge. The viceroy, however, is allowed to enjoy his office until the report of the inſpector has been tranſmitted to the emperor.

98
Power of the viceroys of provinces.

Theſe viceroys are diſtinguiſhed by the title of *Tſong-tou*, and are always mandarins of the firſt claſs, poſſeſſing an almoſt unlimited power within their diſtricts. They march abroad with all the pomp of royal magnificence, never quitting their palaces, on the moſt trifling occaſion, without a guard of 100 men. A viceroy is the receiver general of all the taxes collected in the province, tranſmitting them to the capital, after having reſerved what he judges neceſſary for the demands of his diſtrict. All law-ſuits muſt be brought before his tribunal; and he has the power of paſſing ſentence of death, but it cannot be put in execution without being firſt carried to the emperor. Every three years he ſends to court a report of the conduct of the mandarins ſubordinate to him; and according to the contents, they are either continued or diſgraced. Thoſe of whom he makes an unfavourable report are puniſhed in proportion to their delinquency; while, on the other hand, thoſe who have the good fortune to be well reported, are rewarded in a ſimilar proportion.

99
Degradation of mandarins.

The principal mandarins are ſometimes broke and diſmiſſed from all their employments, while others are only removed ſome degrees lower. Thoſe who have been degraded ten ſteps run a great riſk of never being employed again. Theſe degraded mandarins are kept in perpetual remembrance of their misfortune, by being obliged to mention it in every public order they iſſue forth in their inferior ſtation; thus: "I ſuch a mandarin, degraded one, two, three, &c. ſteps, command and order," &c. Over theſe inferior mandarins the inſpector of the province has a very unlimited authority, and can, by his own power, deprive them of their employments for a great offence; nor does he conſult the court excepting where the immediate puniſhment of the criminal is not neceſſary. Every one of the mandarins, of whatever rank or denomination, is obliged, once in three years, to give in writing an exact account of the faults he has committed in the execution of his office. If he is a mandarin belonging to any of the four firſt claſſes, this confeſſion is examined at court; but if it is made by any of the inferior ones, it muſt be laid before the provincial tribunal of the governor. Government, however, is not ſatisfied even with this confeſſion; inquiry is made into the truth of it, and the conduct of the mandarin is ſcrutinized with the utmoſt ſeverity, the informations being ſubjected to the tribunal of mandarins; where they are carefully examined, the merits and demerits of thoſe ſubjected to this political inquiſition carefully balanced, and their names afterwards divided into three claſſes. The firſt conſiſts of thoſe for whom rewards and preferment are intended; the ſecond, for whom gentle reproof and admonition are thought neceſſary; and the third, of thoſe who are to be ſuſpended for ſome time, or removed altogether, from their offices. Of theſe laſt ſome are allowed to continue; but they receive no ſalary, and are not only deprived of all their emoluments, but even of their honours. If they have been guilty of any action tending to oppreſs the people, or to occaſion a famine or ſcarcity among the lower ranks, their puniſhment is not confined to diſmiſſion from their offices, but they are alſo criminally impeached. The family burying-place of every Chineſe is accounted ſacred; none dares cut down the trees with which it is overſhadowed until they become decayed with age; and even then, not until their condition has been atteſted by a mandarin: but for certain crimes againſt government or the people, the burying-place of a mandarin is raſed to the foundation. No kind of puniſhment, however, inflicted on a father, is ſuppoſed in the leaſt to affect the character of his ſon; and therefore, when the latter is aſked by the emperor concerning his family, he will perhaps coolly anſwer, "My father was diſgraced for ſuch a crime, my grandfather was beheaded for ſuch another," without the acknowledgment being in the leaſt detrimental. On the contrary, by great and important ſervices, it is poſſible for him to wipe out theſe ſtains from the memory of his anceſtors.

Though the empire of China is governed by Tartar princes, the latter ſeem to beſtow much more care and attention on the Chineſe than their own natural ſubjects. Should any diſpute ariſe between a Chineſe and Tartar, the former muſt have greatly deviated from the rules of juſtice, if he is not acquitted even by thoſe tribunals which are compoſed of half Chineſe and half Tartars. The ſlighteſt fault committed by a Tartar mandarin is always ſeverely puniſhed; but the puniſhment of the Chineſe is often mitigated if the delinquent be a Chineſe; and the ſame ſeverity is exerciſed towards thoſe of the military department. Thoſe faults, however, are puniſhed with the greateſt ſeverity which hurt the intereſts of the people; for which reaſon they ſeldom fall a ſacrifice to that claſs of petty tyrants who in other countries prey upon and devour them. Every ſuperior mandarin is obliged to inform himſelf of the faults of his inferiors and expoſe them; nay, he would be puniſhed for them himſelf if he did not.

100
Privileges of princes &c. in China.

Very little regard, as we have already had occaſion to obſerve, is paid to hereditary right in China. Even the princes of the blood enjoy no other privilege by birth but that of wearing a yellow girdle; and the names of their children, with the exact time of their birth, are inſcribed in a yellow book appropriated to that purpoſe. Collateral princes are diſtinguiſhed by an orange girdle, and their children are marked in a book of a red colour. The ſurnames of the princes of the reigning family are determined by the emperor alone; the reſt not being allowed to aſſume any name that too much reſembles thoſe of the Moguls or Chineſe. The rank even of the emperor's ſons diminiſhes one degree every generation; ſo that, at the ſeventh, only the eldeſt branch has a title to wear the yellow girdle, the reſt being ſunk into the rank of plain citizens. An hereditary ſovereignty, however, paſſes from one eldeſt ſon to another; and this title cannot be forfeited, unleſs the poſſeſſor be guilty of ſome crime. In this caſe the emperor appoints to the ſucceſſion either one of his younger brothers or a couſin; but theſe muſt be always choſen from the ſame branch, as the lawful branch cannot be deprived of its right without the condemnation of all who compoſe it. The only hereditary authority of the other princes exiſts among thoſe troops called the *Tartar bands*. There they enjoy, without oppoſition, that rank which they derive from their birth, but in every thing elſe are on a level with others. They are ſubjected to a military examination at ſtated periods, and are always promoted or degraded according to the degree of ſkill they exhibit. The ſame trial is undergone by the heir apparent and his ſons; the only indulgence ſhewn them being, that ſchools are appointed for their particular uſe. The princes are likewiſe indulged with a tribunal appropriated on purpoſe for them, and before which alone they can be tried. An inſult offered to a prince decorated with the yellow girdle is puniſhed with death; but if he has omitted to put it on, the aggreſſor eſcapes with a baſtinading. A prince may be put to death with the emperor's conſent; but he eſcapes every ſlighter corporal puniſhment by paying a fine. Untitled princes have very few privileges ſuperior to thoſe of common citizens; and are generally very poor, unleſs poſſeſſed of ſome lucrative office. Thus they are ſometimes reduced to the neceſſity of accepting the higheſt pay of a common ſoldier in the Tartar bands. When they, or any of their children, however, enter into the marriage-ſtate, the emperor uſually makes them a preſent of 100 ounces of ſilver. He will alſo relieve them on other occaſions, aſſiſt their widows and orphans, &c. but in all this never departs from the moſt exact rules of economy; ſo that the mandarins in this reſpect are much better than the relations of the ſovereign himſelf.

101
F. Amiot's account o the ancien religion China.

With regard to the ancient religion of China, F. Amiot informs us, that, after making every poſſible reſearch, comparing and reaſoning upon his obſervations, he at laſt concluded, that "The Chineſe are a diſtinct people, who have ſtill preſerved the characteriſtic marks of their firſt origin; a people whoſe primitive doctrine will be found, by thoſe who take the trouble of inveſtigating it thoroughly, to agree in its eſſential parts with the doctrine of the choſen people, before Moſes, by the command of God himſelf, had conſigned the explanation of it to the ſacred records; a people, in a word, whoſe traditional knowledge, when freed from whatever the ignorance or ſuperſtition of latter ages has added to it, may be traced back from age to age, and from epocha to epocha, without interruption, for the ſpace of 4000 years, even to the renewal of the human race by the grandſon of Noah." The *king*, or canonical books of the Chineſe, everywhere inculcate the belief of a Supreme Being, the author and preſerver of all things. Under him they mention the names of *Tien*, or heaven; *Chang-tien*, or Supreme heaven; *Chang-ti*, or Supreme Lord; and of *Hoang-chan-ti*, Sovereign and Supreme Lord: " Names (Says M. Groſier) correſponding to thoſe which we uſe when we ſpeak of God, the Lord, the Almighty, the Moſt High.

According to the Chineſe books, the Supreme Being is the principle of every thing that exiſts, and the father of all living; he is eternal, immoveable, and independent; his power knows no bounds; his ſight equally comprehends the paſt, preſent, and the future, penetrating even into the inmoſt receſſes of the heart. Heaven and earth are under his government; all events, all revolutions, are the conſequences of his will; he is pure, holy, and impartial; wickedneſs offends his ſight; but he beholds with an eye of complacency the virtuous actions of men. Severe, yet juſt, he puniſhes vice in a ſtriking manner even on the throne, and often precipitates from thence the guilty, to place upon it the man who walks after his own heart, whom he hath raiſed from obſcurity. Good, merciful, and full of pity, he relents on the repentance of the wicked: public calamities, and the irregularities of the ſeaſons, are only ſalutary warnings, which his fatherly goodneſs gives to men to induce them to reform and amend.

The performance of religious worſhip at the proper and appointed times, has given occaſion to the great exactneſs with reſpect to the kalendar, which is remarkable throughout the empire of China; and all the celebrated emperors have begun their reigns with a reformation of it. Our hiſtorians, however, not contented with diſcovering in the Chineſe religion the fundamental principles of the ancient patriarchal religion, have alſo found in it evident ſymptoms of a knowledge of the Trinity as believed among Chriſtians. " Among the ancient Chineſe characters (ſays M. Groſier), which have eſcaped the ravages of time, we find the following △. According to the dictionary of *Kang-hi*, this ſignifies union; according to the *Choue-ouen* (that book ſo highly eſteemed in China) △ is three united in one; it derives it from the characters *jou* (to enter or penetrate), and *ye*, one; whence it concludes, that △ means three united, penetrated, or incorporated into one. According to another book, accounted a learned and accurate explanation of the ancient characters, ' △ ſignifies ſtrict union, harmony, the chief of good man, of heaven, and of earth; it is the union of the three *tſai* (powers, principles, or intelligences); for, united, they direct, create, and nouriſh together. The image 王 (three united in one figure) is not ſo obſcure in itſelf; however it is difficult to reaſon upon it without being deceived: on this ſubject it is difficult to ſpeak.'

" Father Amiot, ſpite of all the objections which the critics of Europe may make, ſeems to conjecture, that the character △ might have been, among the ancient Chineſe, the ſymbol of the moſt holy Trinity; ' and the more ſo (he adds), as the ancient books furniſh a number of texts, which gives us reaſon to ſuppoſe them to have been poſſeſſed of ſome knowledge of this ſublime myſtery.' The book *See-ki* ſays, ' The emperor formerly offered up a ſolemn ſacrifice every three years to the Spirit, Trinity and Unity, *Chin-ſan-ye*.' The following celebrated text of *Lao-tſe* has long been known in Europe. ' *Tao* is one by nature: the firſt begot the ſecond; two produced the third; the three created all things.'

" F. Amiot quotes another paſſage, which appears to be no leſs ſingular. ' He who is, as it were, viſible, and cannot be ſeen, is named *Khi*; he who may be heard, yet ſpeaketh not to the ears, is called *Hi*; he whom, in a manner, we feel, yet cannot touch, is named *Ouei*. In vain do we interrogate our ſenſes reſpecting theſe three; our reaſon, which alone can give us any ſatisfaction, will tell us that they make only one. Above there is no light; below there is no darkneſs. He is eternal; there is no name which can be given him. He reſembles nothing that exiſts; he is an image without figure; a figure without matter: his light is ſurrounded by darkneſs. If we look up to him above, we behold no beginning; if we follow him, we diſcover no end. From what the *Tao* hath been at all times, conclude what he is, viz. that he is eternal: he is the beginning of wiſdom.' The commentaries which explain this paſſage ſpeak in ſuch ſtrong and preciſe terms, that F. Amiot forbears to quote them, leſt he might incur the cenſure of too many incredulous readers (A)."

The ſacrifices of the Chineſe were firſt offered up in the open fields, or on ſome mountain, upon what they call the *Tan*, which ſignifies a quantity of ſtones thrown together in a round form, or ſimply a round heap of earth. A double fence, called *Kiao*, compoſed of turf and branches of trees, was raiſed around this; and, in the ſpace left between the two fences, two leſſer altars were erected on the right and left; upon which, immediately after the ſacrifice offered up to the *Tien*, they ſacrificed alſo to the *Cheng*, or good ſpirits of every rank, and to their virtuous anceſtors. The ſovereign alone had a right of ſacrificing upon this *Tan*; and the cuſtom of ſacrificing to inferior ſpirits, according to the Chineſe commentators, may be traced even to the days of *Fo-hi* himſelf. The ſame writers add, that, in addreſſing themſelves to the Chang-ti, they conſidered him as the ſovereign lord of the univerſe, clothed with all that power which was neceſſary to ſatiſfy them with regard to the different

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(A) It is a ſingular circumſtance that F. Amiot ſhould have paſſed over in ſilence ſuch unintelligible mummery, without a ſingle animadverſion. Reaſon humbly confeſſes every word of it to be abſolutely incomprehenſible; and faith itſelf has almoſt as hard a ſtruggle in believing it as the never-to-be-fathomed creed of Athanaſius.

objects of their requeſts; but that, in offering up their prayers to the inferior objects of worſhip, they only implored their protection and mediation with the Chang-ti.

While the empire was confined within narrow bounds, one mountain was ſufficient for the ſacrifices; but in proceſs of time it became neceſſary to conſecrate four others. Theſe were ſituated at the extremities of the empire, and were ſuppoſed to correſpond with the four quarters of the world: and the prince went ſucceſſively every year to one of theſe mountains to offer up ſacrifices; taking occaſion at the ſame time to ſhow himſelf to his people, and to inform himſelf of their wants. This cuſtom ſubſiſted for a long time; but at length it was found convenient to add a fifth mountain in the centre of the empire; and ever ſince theſe have been called the five *Yo*, or the five mountains of ſacrifice. This method of ſubjecting the emperor to regular annual journeys could not but be attended with many inconveniences. It was found neceſſary on this account to conſecrate ſome ſpot in the neighbourhood of his palace, which might be ſubſtituted for the *Yo* upon all occaſions when the emperor could not repair to them. An edifice was therefore erected, which at once repreſented the *Kiao*, *Tan*, and the *Hall of anceſtors*. This laſt was a neceſſary part of the edifice; becauſe it was incumbent on thoſe who offered up ſacrifices, firſt to repair to this hall, and acquaint their anceſtors with what they were about to perform; and thither alſo they returned after ſacrificing, to thank the ſame anceſtors for the protection they had received from the Chang-ti; after which they offered up a ſacrifice of thankſgiving in honour of them, and performed certain other ceremonies to ſhow their reſpect. The building contained five ſeparate halls, appropriated to different purpoſes: originally it had neither paintings nor ornaments of any kind, and a ſtaircaſe of nine ſteps conducted to the principal entrance. Afterwards, however, it was much more richly ornamented, each of the five halls being decorated with columns, over which others were placed that ſupported a ſecond roof. In ſucceeding times it was ſtripped of all its ornaments, with a view to bring back religion to its primitive ſimplicity. Its four gates were covered with fine moſs, repreſenting the branches of which the double fence of the ancient *Kiao* were formed. The ridge of the roof was covered with the ſame, and the whole was encompaſſed by a canal filled with water at the time of offering up the ſacrifices. To this a ſecond building was added, which they called the *temple of neatneſs*, and which was uſed only for purifications and ceremonies, the former being entirely conſecrated to the worſhip of the Chang-ti.

At preſent there are only two temples in Peking, named the *Tian-tan* and the *Ti-tan*; in the conſtruction of which all the elegance of Chineſe architecture is diſplayed. Theſe are both dedicated to the Chang-ti, but under different titles; in the one he is adored as the *eternal ſpirit*; in the other, as the creator and preſerver of the world. The ceremonies of the modern ſacrifices are greatly multiplied; and nothing can exceed the ſplendor and magnificence with which theſe ſolemnities are performed. Sometimes before the day appointed for the grand ceremony, the monarch, the grandees of the court, and all thoſe whom their employments qualify to aſſiſt at the ſolemnity, prepare themſelves by retirement, faſting, and continence; no audience is given by the emperor, and the tribunals are entirely ſhut; marriages, funerals rejoicings, and entertainments of every kind, are then forbidden. At laſt, on the day appointed, the emperor appears, attended by an innumerable multitude, and his perſon ſurrounded by a vaſt number of princes, lords, and officers, while every part of the temple ſeems to correſpond with the magnificence of the ſovereign; all the vaſes and utenſils employed in the ſacrifices are of gold, and cannot be applied to any other purpoſe; even the inſtruments of muſic are of enormous magnitude, and never uſed anywhere elſe. All this grandeur, however, ſerves only to diſplay in a more eminent manner the humility and abaſement of the monarch during his devotion; at which time he rolls in the duſt, and ſpeaks of himſelf before the *Chang-ti* in terms of the moſt abject ſubmiſſion and humiliation.

103 Sect of Tao-ſſe.

The purity of the ancient Chineſe religion has, however, been long contaminated by many idolatrous and fanatical ſects. Among theſe, one named *Tao-ſſe* was founded by a philoſopher called *Lao kiun* or *Lao-tſe*, who was born 603 B. C. He died in an advanced age, leaving to his diſciples a book entitled *Tao-te*, being a collection of 5000 ſentences. His morality has a great reſemblance to that of Epicurus. It conſiſts principally in baniſhing all vehement deſires and paſſions capable of diſturbing the peace and tranquillity of the ſoul. According to him, the care of every wiſe man ought to be only to endeavour to live free from grief and pain, and to glide gently down the ſtream of life devoid of anxiety and care. To arrive at this happy ſtate he adviſes his followers to baniſh all thoughts of the paſt, and to abſtain from every vain and uſeleſs inquiry concerning futurity, as well as all tormenting thoughts of ambition, avarice, &c. It was found by the diſciples of this philoſopher, however, that all their endeavours to obtain a perfect tranquillity of mind were vain, as long as the thoughts of death intervened; they therefore declared it poſſible to diſcover a compoſition from which drink might be made that would render mankind immortal. Hence they were led to the ſtudy of chemiſtry; and, like the weſtern alchemiſts, wearied themſelves in ſearch of the philoſopher's ſtone, until at laſt they gave themſelves up to all the extravagancies of magic.

The deſire of avoiding death, together with the credulity natural to unenlightened minds, quickly produced a number of converts to the ſect of *Tao-ſſe*. Magical practices, the invocation of ſpirits, and the art of foretelling events by divination, quickly diffuſed themſelves over the empire, and the imbecility of the emperors contributed to propagate the deception. Temples conſecrated to ſpirits quickly reared their heads in every corner of the empire; and two of the moſt celebrated of the ſect were authorized to maintain public worſhip there after the form which had been preſcribed by their maſter. At the ſame time they diſtributed, and ſold at a dear rate, images of the imaginary ſpirits with which they had peopled the heavens and the earth. Theſe were, by their command, worſhipped as ſo many deities independent of the Supreme Being; and in like manner, ſeveral of the ancient emperors were invoked as gods.

Being patronized by the emperors of ſeveral dynaſties, this ſect became more and more powerful. At laſt they had the impudence to affix, during the night-time, to one of the gates of the imperial city, a book filled with myſtic characters and magical figures. At break of day they informed the emperor of the ſudden appearance of this book, and publicly declared that it was fallen from heaven. This trick eaſily impoſed upon the weak prince. He immediately repaired, with a numerous train, to the ſpot where the ſacred volume appeared; and having taken it into his hands in a reſpectful manner, carried it in triumph to his palace, where he ſhut it up in a golden box. Another emperor carried his reverence for the ſect to ſuch a height of impiety and extravagance, as to order a celebrated *Tao ſſe* to be publicly worſhipped under the name of *Chang-ti*. The ſect thus patronized by the princes, and accommodated to the credulity of the vulgar, continued to gain ground in ſpite of every oppoſition from the wiſer part of the people, and is ſtill very powerful in China. At preſent they offer up three different victims, a hog, a fowl, and a fiſh, to a ſpirit whom they invoke. Various ceremonies, ſuch as howling, drawing fantaſtical figures upon paper, making a hideous noiſe with kettles and drums, are uſed in their incantations; and though it may readily be believed that they are for the moſt part unſucceſsful, yet their credit is ſtill kept up by thoſe caſes in which they ſucceed by accident.

The chief of the *Tao-ſſe* is inveſted by government with the dignity of grand mandarin, which is enjoyed by his ſucceſſors: he reſides in a ſumptuous palace in a town of Kiang-ſi; and the ſuperſtitious confidence of the people attracts an immenſe number thither from all parts of the empire. Some arrive in order to be cured of diſeaſes, others to get an inſight into futurity. The impoſtor diſtributes to them ſmall bits of paper filled with magical characters; and the ignorant wretches depart well ſatisfied, without grudging the expence of their journey, though ever ſo long.

104
Of the worſhippers of Fo.

A ſtill more pernicious and more widely diffuſed ſect is that of the idol *Fo*, which came originally from India. The *Tao-ſſe* had promiſed to the brother of one of the emperors of China to introduce him to a communication with ſpirits. The credulous prince having heard of a great ſpirit named *Fo*, who reſided in India, prevailed on his brother to ſend an embaſſy thither. On the arrival of the ambaſſadors, however, they could find only two worſhippers of this deity, both of whom they brought to China. Several images of Fo were alſo collected at the ſame time; and theſe, together with ſome canonical books of the Indians, were placed on a white horſe, and carried in proceſſion to the imperial city.

This ſuperſtition was introduced into China about the 65th year of the Chriſtian æra, and ſoon made vaſt progreſs. One of its principal doctrines is that of the metempſychoſis, or tranſmigration of ſouls, of which M. Groſier thinks he was the inventor, and that Pythagoras, who travelled into ſeveral parts of India, had borrowed the doctrine from him. The account given of him by the bonzes is, that finding himſelf, at the age of 70, oppreſſed with infirmities, he called his diſciples together, and told them he was unwilling to leave the world without communicating the ſecret and hidden myſteries of his doctrine; which were, in ſhort, that all things had proceeded from a vacuum and nothing, and to that they muſt return. This doctrine produced a correſponding mode of action, or rather of inaction, in thoſe who believed it: for thus the great happineſs of man was made to conſiſt in abſolute annihilation; and therefore the nearer he could bring himſelf to this ſtate during life, the happier he was ſuppoſed to be.

The common doctrine, however, which admits of a diſtinction between good and evil, finds more proſelytes among the vulgar, whoſe ſituation in life will not allow them to ſpend their time in perpetual idleneſs. According to this, the righteous will be rewarded and the wicked puniſhed after death. They ſay alſo, that the god Fo came to ſave mankind, and to expiate their ſins; and that he alone can procure them a happy regeneration in the life to come. Five precepts are likewiſe inculcated on thoſe who adopt this doctrine: 1. Not to kill any living creature; 2. Not to take away the goods of another; 3. Not to pollute themſelves by uncleanneſs; 4. Not to lie; and, 5. Not to drink wine. Above all, they recommend to them to perform acts of mercy, to treat their bonzes well, build temples, &c.

The doctrine of metempſychoſis has introduced into China an infinite number of idols, who are all worſhipped on the ſuppoſition that the ſpirit of Fo has tranſmigrated into the animals they repreſent. Theſe idols, however, ſeem not to be worſhipped with great ſincerity; but, like the images of ſaints in the more ſuperſtitious countries of Europe, are beaten and thrown in the dirt when their votaries happen not to obtain their deſires, which they impute to the obſtinacy or weakneſs of the idol. Nay, M. Groſier gives an account of one man, who having ineffectually paid a ſum of money to the bonzes of a certain idol for the cure of his daughter, brought a formal accuſation againſt the idol himſelf; and in ſpite of all that the bonzes could ſay in its behalf, got its worſhip ſuppreſſed throughout the province.

105
Bad character of the bonzes.

The bonzes of China are repreſented as a moſt avaricious and hypocritical race of men, ready to practiſe every kind of villany, and even to ſubject themſelves to the moſt intolerable tortures, in order to obtain money from the compaſſion of the public when they cannot get it in any other way; and an edict of one of the emperors is cited by M. Groſier, by which great numbers of their religious houſes were ſuppreſſed. In order to perpetuate their ſect, they purchaſe young children, whom they take care to inſtruct in all the myſteries and tricks of their profeſſion; but excepting this, they are in general very ignorant, and few of them would be able to give any tolerable account of the tenets of their own ſect. They are not ſubject to a regular hierarchy, but acknowledge ſuperiors among them whom they call grand bonzes, who have the firſt place in all religious aſſemblies at which they happen to be preſent: and great profit is derived from certain religious clubs, both of men and women, at which the bonzes are always called to aſſiſt. Their wealth is likewiſe augmented by pilgrimages to certain places where there are temples more or leſs reverenced, and where a multitude of abſurd ceremonies are performed. Theſe bonzes, as may be eaſily imagined, are inveterate enemies to the progreſs of Chriſtianity, telling the moſt abſurd ſtories concerning the miſſionaries; as that they pluck out the eyes of their converts to conſtruct teleſcopes with, &c. The literati, however, and the more ſenſible part of the nation, hold them in the greateſt contempt.

106 Ridiculous ſuperſtition of the *fong-choui.*

We ſhall conclude this detail of the Chineſe religion with giving an account of one other ſuperſtition which ſeems peculiar to the nation. It is named *fong-choui*, which ſignifies wind and water. By this they mean the lucky or unlucky ſituation of a houſe, burying-place, &c. If any imprudent perſon has built a houſe cloſe to that of a Chineſe, in ſuch a manner that the angle formed by its roof flanks the wall or roof of the former houſe, the proprietor ever after lives in terror of utter ruin and deſtruction from the malignant influence of that angle. An implacable hatred inſtantly commences betwixt the two families, and often gives riſe to a law-ſuit, which furniſhes matter of diſcuſſion for ſome of the ſuperior tribunals. If no redreſs can be had at law, however, the Chineſe is then reduced to the neceſſity of erecting, on the top of his houſe, an enormous image of a dragon, or ſome other monſter, with its mouth gaping towards the angle, and, as it were, threatening to ſwallow it up; after which the apprehenſions of the proprietor begin to ſubſide, and tranquillity is reſtored to the family. In this manner the governor of *Kien-tchang* ſecured himſelf from the influence of the church of the Jeſuits, which, being built on an eminence, overlooked his palace. Not depending, however, entirely on the good offices of his tutelary dragon, he alſo took the wiſe precaution of altering his principal apartments, and raiſing, at the diſtance of 200 paces from the church, a kind of large facade three ſtories high. But unluckily the death of his ſucceſſor was attributed to this facade; for the mandarin being attacked with a diſorder in the breaſt, which made him ſpit up a white phlegm, this ſymptom was thought to be owing to the walls of the facade, which were very white, and which were fortwith painted black. The ſalutary precaution, however, happened to be taken too late; for the governor died notwithſtanding the black colour of the walls.

“ We ſhould never have done (ſays M. Groſier), were we to relate all the ſuperſtitious ideas of the Chineſe, reſpecting the lucky and unlucky ſituation of houſes, the quarter which doors ought to front, and the plan and day proper for conſtructing the ſtoves in which they cook their rice.” But the object on which they employ their greateſt care is the choice of the ground and ſituation for a burying-place. Some quacks follow no other profeſſion than that of pointing out hills and mountains which have an aſpect favourable for works of that kind. When a Chineſe is perſuaded of the truth of ſuch information, there is no ſum which he would not give to be in poſſeſſion of the fortunate ſpot. The greater part of the Chineſe are of opinion that all the happineſs and misfortunes of life depend upon the *fong choui.*

107 Jews and Mahometans in China.

A colony of Jews was eſtabliſhed in China about the year 206 B. C.; but they are now reduced to a ſmall number of families at Cai-fong, the capital of the province of Honan. The Mahometans have multiplied much more than the Jews. It is above 600 years ſince they firſt entered the empire, where they have formed different eſtabliſhments. At firſt their number was augmented only by marriages; but for ſome time paſt they have been more particularly attentive to the extending of their ſect and propagating their doctrine. The principal means employed for this purpoſe are, to purchaſe a great number of children brought up in idolatry, whom their poor parents are glad to part with; and theſe they circumciſe, and afterwards inſtruct in the principles of their religion. During the time of a famine which deſolated the province of Chang-tong, they purchaſed more than 10,000 of theſe children; for whom, when grown up, they procured wives, built houſes, and even formed whole villages of them. They are now become ſo numerous, that in the places where they reſide they entirely exclude every inhabitant who does not believe in their prophet, and frequent a moſque.

108 Ceremonies of marriage.

With regard to the manners of the Chineſe, they bear no reſemblance to thoſe of any other nation; and, if we may believe their hiſtorians, they are the ſame at this day that they were 4000 years ago. The women are condemned almoſt to perpetual impriſonment within the precincts of their own houſes, and are never ſeen even by their intended huſbands before marriage. He knows nothing of her looks or perſon, but from the account of ſome female relation or confidant, who in ſuch caſes acts the part of match-maker; though if impoſed upon either with regard to her age or figure, he can have recourſe to a divorce. The ſame matrons who negociate the marriage, alſo determine the ſum which the intended huſband muſt pay to the parents of the bride: for in China a father does not give a dowry to his daughter; it is the huſband who gives a dowry to the wife. When the day appointed for the marriage is arrived, the bride is placed in a chair or cloſe palanquin, the key of which is committed to the care of a truſty domeſtic, who muſt deliver it to none but the huſband. The latter, richly dreſſed, waits at his gate for the arrival of the proceſſion. As ſoon as it approaches, the key is put into his hands; he eagerly opens the chair, and for the firſt time perceives his good or bad fortune. If he is contented with his new ſpouſe, the bride deſcends and enters the houſe, where the marriage is concluded by feaſting and merriment as in other countries; but if the bridegroom is very much diſappointed, he ſuddenly ſhuts the chair, and ſends the bride home to her relations. To get rid of her in this manner, however, coſts a ſum equal to what he originally gave in dowry to obtain her.

The Chineſe women, even of the firſt rank, ſeldom quit their apartment, which is ſituated in the moſt retired part of the houſe, and in which they are ſecluded from all ſociety but that of their domeſtics. The book of ceremonies requires that there ſhould be two apartments in every houſe; the exterior one for the huſband, the interior for the wife. They muſt even be ſeparated by a wall or wooden partition, the door of which is carefully guarded; nor is the huſband at liberty to enter the wife's apartment, or ſhe to quit it, without ſufficient reaſon. According to the ſame book, the prattling and loquacity of a woman are reckoned ſufficient grounds for a divorce. If this be founded in fact, the women of China are either unexampled for taciturnity, or elſe multitudes of divorces muſt be daily occurrences. A woman, however, cannot be divorced on any account; if ſhe loſes her parents after marriage, or if ſhe has worn three years mourning for the loſs of her huſband, father, or mother.

A widow of any rank above the common, who has children, ſeldom enters a ſecond time into the marriage ſtate, though thoſe of the ordinary rank generally do. The poorer ſort are not at liberty to follow their own inclination, but are ſold for the behoof of the parents of the deceaſed. As ſoon as the bargain is concluded, a couple of porters bring a chair, which is guarded by a number of truſty people. In this the widow is ſhut up, and thus conducted to her new huſband.

"Maſters (ſays M. Groſier), for the moſt part, are very deſirous of promoting marriage among their ſlaves, whatever Mr Paw may ſay; who, without any foundation, has ventured boldly to aſſert the contrary. They have even very ſtrong motives to induce them to encourage theſe marriages; the children produced by them are ſtill their ſlaves; and beſides their becoming new property to them, the fathers and mothers are thus more ſtrongly attached to their ſervice."

109 oncubiage toleated.

Concubinage is tolerated in China, though not authorized by any law. This privilege is granted only to the emperor, the princes of the blood, and mandarins; and none but the emperor is permitted to have more than one. The common people generally avail themſelves of the toleration granted them in this reſpect, and will have two or three concubines if they can afford it. They are, however, careful to excuſe themſelves as well as they can to their wives in this reſpect; pretending only a deſire to have many children, and a number of women to attend their wives. Others, deſirous of having a male child, while perhaps their lawful wife cannot have any, take a concubine for this reaſon only, and diſmiſs her as ſoon as their wiſhes are accompliſhed: they then permit her to marry whom ſhe pleaſes, and frequently even provide a huſband for her themſelves. Theſe concubines are almoſt all procured from two cities named *Tang-tcheou* and *Sou-tcheou*, where they are educated, and taught ſinging, dancing, muſic, and every accompliſhment ſuitable to women of quality, or which can render them agreeable and pleaſing. The greateſt part of them are purchaſed in other places, to be again diſpoſed of; and this is the principal branch of trade carried on by theſe two cities. Unlawful intrigues are ſeldom heard of in China. Whoever ſeduces the wife of another is puniſhed with death; and the ſame puniſhment is generally inflicted on the perſon who debauches a young woman.

100 ducation children.

From the accounts we have of the education of children in China, one might be apt to conclude, that, inſtead of being the ignorant ſuperſtitious race already deſcribed, they ought to be the moſt intelligent people in the world. The book of ceremonies directs the education of a child to commence as ſoon as it is born, and deſcribes exactly the qualities which its nurſe ought to have. She muſt ſpeak little, adhere ſtrictly to truth, have a mild temper, behave with affability to her equals, and with reſpect to her ſuperiors. The child is taught to uſe the right hand as ſoon as it can put its hand to its mouth, and then it is weaned. At ſix years of age, if a male, he is taught the numbers moſt in uſe, and made acquainted with the names of the principal parts of the world; at ſeven, he is ſeparated from his ſiſters, and no longer allowed to eat with them, nor to ſit down in their preſence; at eight, he is inſtructed in the rules of good breeding and politeneſs; at nine, he ſtudies the kalendar; at ten, he is ſent to a public ſchool, where he learns to read, write, and caſt accounts; from 13 to 15 he is taught muſic, and every thing that he ſings conſiſts of moral precepts. It was formerly the cuſtom, that all the leſſons deſigned for the Chineſe youth were in verſe; and it is to this day lamented, that the ſame cuſtom is not followed, as their education has ſince been rendered much more difficult and laborious.

At the age of 15, the Chineſe boys are taught to handle the bow and arrow, and to mount on horſeback; at 20 they receive the firſt cap, if they are thought to deſerve it, and are permitted to wear ſilk dreſſes ornamented with furs; but before that period they are not allowed to wear any other thing than cotton.

Another method of initiating children into the principles of knowledge in this empire is, by ſelecting a number of characters expreſſive of the moſt common objects, engraving or painting them ſeparately on ſome kind of ſubſtance, and, under the thing repreſented, putting the name, which points out to them the meaning of the word.

As the Chineſe have no proper alphabet, they repreſent almoſt every thing by different characters. The labour of their youth, therefore, is intolerable; being obliged to ſtudy many thouſand characters, each of which has a diſtinct and appropriate ſignification. Some idea of their difficulties may be obtained from what we are told by F. Martini, who aſſures us, that he was under the neceſſity of learning 60,000 different characters before he could read the Chineſe authors with tolerable eaſe.

The book firſt put into the hands of the Chineſe children is an abridgement, which points out what a child ought to learn, and the manner in which he ſhould be taught. This volume is a collection of ſhort ſentences, conſiſting of three or four verſes each, all of which rhyme; and they are obliged to give an account in the evening of what they have learned in the day. After this elementary treatiſe, they put into their hands the four books which contain the doctrines of Confucius and Mencius. The ſenſe and meaning of the work is never explained to them until they have got by heart all the characters, that is to ſay, the *words* in the book; a method no doubt inconceivably diſguſting, and calculated utterly to deſtroy the genius of a boy, if he has any. While they are getting theſe characters by heart, indeed, they are likewiſe employed in learning to form them with a pencil. For this purpoſe they are furniſhed with large leaves of paper, on which are written or printed with red ink very big characters; and all they are required to do is to cover thoſe red characters with black ink, and to follow exactly their ſhape and figure; which inſenſibly accuſtoms them to form the different ſtrokes. After this they are made to trace other characters, placed under the paper on which they write. Theſe are black, and much ſmaller than the other. It is a great advantage to the Chineſe literati to be able to paint characters well; and on this account they beſtow great pains in forming the hands of young people. This is of the utmoſt conſequence to literary ſtudents in the examinations

nations which they are obliged to undergo before they can be admitted to the firſt degree. Du Halde gives a remarkable inſtance, viz. that "a candidate for degrees having, contrary to order, made uſe of an abbreviation in writing the character *ma*, which ſignifies a horſe, had the mortification of ſeeing his compoſition, though in other reſpects excellent, rejected merely on that account; beſides being ſeverely rallied by the mandarin, who told him a horſe could not walk unleſs he had all his legs."

After the ſcholar has made himſelf maſter of the characters, he is then allowed to compoſe: but the ſubject of his compoſition is pointed out to him only by one word. Competitions are likewiſe eſtabliſhed in China, but moſt of them are of a private nature. Twenty or thirty families, who are all of the ſame name, and who conſequently have only one hall for the names of their anceſtors, agree among themſelves to ſend their children twice a-month to this hall in order to compoſe. Each head of a family in turn gives the ſubject of this literary conteſt, and adjudges the prize; but this coſts him a dinner, which he muſt cauſe to be carried to the hall of competition. A fine of about tenpence is impoſed on the parent of each ſcholar who abſents himſelf from this exerciſe.

Beſides theſe private competitions, every ſtudent is obliged to compete at leaſt twice a-year under the inſpection of an inferior mandarin of letters, ſtyled *Hio-kouan*. It frequently happens alſo, that the mandarins of letters order theſe ſtudents to be brought before them, to examine the progreſs they have made in their ſtudies, to excite a ſpirit of emulation among them, and make them give ſuch application as may qualify them for any employment in the ſtate. Even the governors of cities do not think it below their dignity to take this care upon themſelves; ordering all thoſe ſtudents who reſide near them to appear before their tribunal once a-month: the author of the beſt compoſition is honoured with a prize, and the governor treats all the candidates on the day of competition at his own expence. In every city, town, and village in China, there are ſchoolmaſters who teach ſuch ſciences as are known in that country. Parents poſſeſſed of a certain fortune provide maſters for their children, to attend and inſtruct them, to form their minds to virtue, and to initiate them in the rules of good breeding and the accuſtomed ceremonies, as well as to make them acquainted with the laws and hiſtory, if their age will admit. Theſe maſters have for the moſt part attained to one or two degrees among the literati, and not unfrequently arrive at the firſt employments of the ſtate.

The education of the Chineſe women is confined to giving them a taſte for ſolitude, and accuſtoming them to modeſty and ſilence; and, if their parents are rich, they are likewiſe inſtructed in ſuch accompliſhments as may render them agreeable to the other ſex.

111 Dreſs.

There is little diſtinction in China between the ordinary dreſs of men and women. Rank and dignity are diſtinguiſhed by certain acceſſary ornaments; and the perſon would be ſeverley chaſtiſed who ſhould preſume to aſſume them without being properly authorized. The dreſs in general conſiſts of a long veſt which reaches to the ground. One part of this veſt, viz. that on the left ſide, folds over the other, and is faſtened to the right by four or five ſmall gold or ſilver buttons, placed at a little diſtance from one another. The ſleeves are wide towards the ſhoulder, growing narrower as they approach the wriſt, where they terminate in the form of a horſe ſhoe, covering the hands entirely, and leaving nothing but the ends of the fingers to be ſeen. Round their middle they wear a large girdle of ſilk, the ends of which hang down to their knees. From this girdle is ſuſpended a ſheath, containing a knife and two of thoſe ſmall ſticks which they uſe as forks. Below this robe they wear a pair of drawers, in ſummer made of linen, and in winter of ſatin lined with fur, ſometimes of cotton, and in ſome of the northern provinces of ſkins. Theſe are ſometimes covered with another pair of white taffety. Their ſhirts are always very ſhort and wide, of different kinds of cloth, according to the ſeaſon. Under theſe they wear a ſilk net to prevent it from adhering to the ſkin. In warm weather they have their necks always bare; when it is cold, they wear a collar made of ſilk and ſable, or fox's ſkin, joined to their robe, which in winter is trimmed with ſheep ſkin, or quilted with ſilk and cotton. That of people of quality is entirely lined with beautiful ſable ſkins brought from Tartary, or with the fineſt fox's ſkin, trimmed with ſable; and in the ſpring it is lined with ermine. Above their robe they wear alſo a kind of ſurtout with wide ſleeves, but very ſhort, which is lined in the ſame manner. The emperor and princes of the blood only have a right to wear yellow; certain mandarins have liberty to wear ſatin of a red ground, but only upon days of ceremony: in general they are clothed in black, blue, or violet. The common people are allowed to wear no other colours but blue or black; and their dreſs is always compoſed of plain cotton cloth.

112 Chineſe obliged b the Tarta to cut off their hair.

Formerly the Chineſe were at great pains to preſerve their hair; but the Tartars, who ſubdued them, compelled them to cut off the greater part of it, and to alter the form of their clothes after the Tartar faſhion. This revolution in dreſs was not affected without bloodſhed, though the conqueror at the ſame time adopted in other reſpects the laws, manners, and cuſtoms of the conquered people. Thus the Chineſe are painted as if bald, but they are not ſo naturally: that ſmall portion of hair which they preſerve behind, or on the tops of their heads, is all that is now allowed them. This they wear very long, and plait like a tail. In ſummer they wear a kind of cap ſhaped like an inverted cone, lined with ſatin, and covered with ratan or cane very prettily wrought. The top terminates in a point, to which they fix a tuft of red hair, which ſpreads over it, and covers it to the brim. This hair grows between the legs of a kind of cow, and is capable of taking any colour, eſpecially a deep red This ornament is much uſed, and any perſon who chooſes may wear it.

The mandarins and literati wear a cap of the ſame form as the foregoing, only it is lined with red ſatin, and covered on the outſide with white. A large tuft of the fineſt red ſilk is fixed over it, which is ſuffered to hang down or wave with the wind. People of diſtinction generally uſe the common cap when they mount on horſeback or during bad weather; being better calculated to keep off rain, and ſhelter thoſe who wear it from the rays of the ſun. For winter they have another cap bordered with ſable, ermine, or fox's ſkin, and ornamented with a tuft of ſilk like the former. In theſe fur-trimmings they are very curious, ſometimes expending 40 or 50 ounces of ſilver upon them.

The Chineſe people of rank never go abroad without boots made of ſatin or ſome other ſilk, and ſometimes of cotton, but always dyed. They have neither heel nor top, and are made to fit the foot with the greateſt exactneſs. When they travel on horſeback, however, they have others made of the ſkin of a cow or horſe made very pliable. Their boot-ſtockings are of ſilk ſtuff, quilted and lined with cotton, reaching above the top of their boot, and ornamented with a border of velvet or cloth. In ſummer they wear a cooler kind, and in their houſes a ſort of ſlippers made of ſilk ſtuff. The common people are contented with black ſlippers made of cotton cloth. The fan is alſo a neceſſary appendage of the Chineſe dreſs, and is reckoned equally neceſſary with the boots.

The dreſs of the women conſiſts of a long robe quite cloſe at top, and long enough to cover even their toes, with ſleeves ſo long that they could hang down upon the ground, did they not take care to tuck them up; but their hands are ſeldom ſeen. The colour of their dreſſes is entirely arbitrary, but black and violet are generally choſen by thoſe advanced in life. The young ladies, like thoſe of Europe, make uſe of paint to give a bloom to their complexions; but this, though not the ſame with the kind uſed in Europe, agrees with it in the effect of ſoon wrinkling the ſkin. Their general head dreſs conſiſts in arranging their hair in ſeveral curls, among which are interſperſed ſmall tufts of gold or ſilver flowers. According to Du Halde, ſome of them ornament their heads with the image of a fabulous bird, concerning which many ſtories are told. This is made of copper or ſilver gilt, its wings extended and lying pretty cloſe to the head-dreſs, embracing the upper part of their temples, while the long ſpreading tail forms a kind of plume on the top of the head. Its body is directly over the head, and the neck and bill hang down, the former being joined to the body by a concealed hinge, in order that it may play freely, and move about on the leaſt motion of the head. The whole bird adheres to the head by means of the claws, which are fixed in the hair.

Ladies of quality ſometimes wear ſeveral of theſe birds made up into a ſingle ornament, the workmanſhip of which is very expenſive. Young ladies wear alſo a crown made of paſteboard, the fore part of which riſes in a point above the forehead, and is covered with jewels. The reſt of the head is decorated with natural or artificial flowers, among which ſmall diamond pins are interſperſed. The head-dreſs of the ordinary claſs of women, eſpecially when they are advanced in years, conſiſts only of a piece of very fine ſilk wrapped round their heads.

113
Abſurd cuſtom of preventing the feet of female infants from growing.

All authors agree, that an abſurd cuſtom prevails throughout China, of confining the feet of female infants in ſuch a manner that they are never allowed to grow to near their full ſize. The ſmallneſs of their feet is accounted ſuch a valuable beauty, that the Chineſe women never think they can pay too dear for it. As ſoon therefore as a female infant is born, the nurſe wraps up its feet in very tight bandages; and this torture muſt be endured until their feet have ceaſed to grow. So prevalent is the force of cuſtom, however, that as the child grows up ſhe voluntarily ſubmits to new tortures, in order to accompliſh the purpoſe more effectually. Thus the Chineſe women are deprived almoſt entirely of the uſe of their feet; and are ſcarce able to walk, in the moſt awkward hobbling manner, for the ſhorteſt ſpace. The ſhoe of a full grown Chineſe woman will frequently not exceed ſix inches.

The Chineſe uſe white as the colour proper for mourning; and though a ſon cannot wear this while his father and mother are alive, he can uſe no other for three years after their death; and ever afterwards his clothes muſt be of one colour. The law has forbidden the uſe of ſilks and furs to children; and has even preſcribed the time when they are firſt to wear a cap. This is put upon their heads by the maſter of ceremonies himſelf, who addreſſes them in the following manner: "Conſider that you now receive the dreſs of thoſe who have attained to maturity, and that you ceaſe to be children; renounce, therefore, all childiſh thoughts and inclinations, aſſume a grave and ſerious deportment, apply with reſolution to the ſtudy of virtue and wiſdom, and endeavour to merit a long and happy life." "This ceremony (ſays M. Groſier), which may appear trifling, is attended with the happieſt effects. The Chineſe give a kind of importance to every thing which can inſpire youth with a taſte for morality and a love of good order. It might be uſeful to mankind at every fixed epocha of their lives to remind them of thoſe new duties impoſed by each ſucceſſive change; but, by uniting the ſolemnity of a public ceremony to this inſtruction, it will make a deeper impreſſion, and remain much longer imprinted on their memories."

114
Exceſſive ceremoniouſneſs of the Chineſe.

Nothing can appear more irkſome to an European than the multitude of ceremonies uſed on all occaſions by the Chineſe. An invitation to an entertainment is not ſuppoſed to be given with ſincerity until it has been renewed three or four times in writing. A card is ſent on the evening before the entertainment, another on the morning of the appointed day, and a third when every thing is prepared and the gueſts ready to ſit down to the table. The maſter of the houſe always introduces his gueſts into the hall, where he ſalutes them one after another. He then orders wine to be brought him in a ſmall cup made of ſilver, porcelain, or precious wood, and placed upon a ſmall varniſhed ſalver. He lays hold of it with both his hands, makes a bow to all the ſurrounding gueſts, and advances towards the fore part of the hall, which generally looks into a large court. He there raiſes his eyes and the cup towards heaven; after which he pours the wine on the ground. He afterwards pours ſome wine into a ſilver or porcelain cup, makes a bow to the moſt conſiderable perſon in company, and then goes to place the cup on the table before him; for in China every gueſt has a table for himſelf. The perſon for whom he intends this honour, however, generally ſaves him the trouble of placing the cup; calls for wine in his turn, and offers to place the cup on the maſter's table, who endeavours to prevent him, with a thouſand apologies and compliments according to the rules of Chineſe politeneſs. A ſuperior domeſtic conducts the principal gueſt to an elbow chair covered with rich flowered ſilk, where the ſtranger again begins his compliments, and begs to be excuſed from ſitting in ſuch an honourable ſeat, which nevertheleſs he accepts of; and all the reſt of the gueſts do the ſame, otherwiſe the ceremonial would be gone through with each of them. The entertainment is concluded by ſome theatrical repreſentations, accompanied with the muſic of the country; which, however, would give but little pleaſure to an European. Beſides the gueſts, a certain number of people are admitted into the court in order to behold theſe theatrical repreſentations; and even the women are allowed to view them through a wicket, contrived ſo that they may behold them without being ſeen themſelves.

The entertainments of the Chineſe are begun, not by eating, but by drinking; and the liquor they drink muſt always be pure wine. The intendant, or *maitre d'hotel*, falling down on one knee, firſt invites the gueſts to take a glaſs; on which each of them lays hold with both hands of that which is placed before him, raiſing it as high as the forehead, then bringing it lower down than the table, and at laſt putting it to his mouth: they all drink together, and very ſlowly, taking three or four draughts. While they are drinking, the diſhes on each of the tables are removed, and others brought in. Each of the gueſts has twenty-four ſet before him in ſucceſſion; all of them fat, and in the form of ragouts. They never uſe knives in their repaſts; and two ſmall pointed ſticks, ornamented with ivory or ſilver, ſerve them inſtead of forks. They never begin to eat, however, until they are invited by the *maitre d'hotel;* and the ſame ceremony muſt be gone through every time they are going to take a cup of wine, or begin a new diſh. Towards the middle of the entertainment the ſoup is brought in, accompanied with ſmall loaves or meat pies. Theſe they take up with their ſmall ſticks, ſteep them in the ſoup, and eat them without waiting for any ſignal, or being obliged to keep time with the reſt of the gueſts. The entertainment, however, continues in other reſpects with the utmoſt formality until tea is brought in; after which they retire from table and amuſe themſelves in another hall, or in the garden, for a ſhort time, until the deſſert be brought in. This, like the entertainment itſelf, conſiſts of 24 diſhes, which are made up of ſweetmeats, fruits differently prepared, hams and ſalted ducks which have been baked or dried in the ſun, with ſhell and other kinds of fiſh. The ſame ceremonies which preceded the repaſt are now renewed, and every one ſits down at the ſame place he occupied before. Larger cups are then brought in, and the maſter invites the gueſts to drink more freely.

Theſe entertainments begin towards evening, and never end till midnight. A ſmall ſum of money is given to the domeſtics; when every one of the gueſts goes home in a chair preceded by ſeveral ſervants, who carry large lanthorns of oiled paper, on which are inſcribed the quality, and ſometimes the name, of the maſter. Without ſuch an attendance they would be taken up by the guard; and the day following they never fail to return a card of thanks to the officer.

Their method of drinking tea is not like that of other nations. A ſmall quantity of bohea, ſufficient to tinge the water and render it palatable (for they drink no green), is taken in the morning, and thrown into a veſſel adapted to the number in family. This ſtands till milk-warm; in which ſtate it is kept the whole day, and a cup drank now and then without ſugar or milk, in order to exhilarate the ſpirits when exhauſted by fatigue: and if a ſtranger call by accident, or a viſitor by appointment, the firſt thing preſented, after the uſual ceremonies of meeting, is a very ſmall pipe filled with tobacco of their own growth, and a cup of the tea already mentioned, or of ſome freſh made of better quality, together with ſweetmeats, &c. Tea is the daily beverage in China, and is drank by all ranks of people.

Some change has been made in the ceremonial of the Chineſe by the Tartar conqueſt, and ſome new diſhes alſo introduced by the ſame means; and here M. Groſier obſerves, that the Tartars are much better cooks than the Chineſe. All their diſhes are highly ſeaſoned; and by a variation in the proportions of their ſpiceries, they are able to form a variety of diſhes out of the ſame materials. None of their viands, however, are more eſteemed than ſtags ſinews, and the neſts of a particular ſpecies of birds, which have the property of giving a moſt agreeable reliſh to whatever is mixed with them. Other diſhes are introduced at theſe repaſts, which would be accounted very diſagreeable with us; ſuch as the fleſh of wild horſes, the paws of a bear, and the feet of ſeveral wild animals. The greater part of theſe proviſions are brought preſerved in ſalt from Siam, Camboya, and Tartary.

115 Chineſe wines. The wines of China have no reſemblance to ours either in taſte or quality, being procured from rice, and not from the vine. A particular kind of rice is employed for making them, and the grain is ſteeped for 20 or 30 days in water, into which ingredients of a different nature are ſucceſſively thrown: they afterwards boil it; and as ſoon as it becomes diſſolved by the heat, it immediately ferments, and throws up a vaporous ſcum not unlike new wine. A very pure liquor is found under this ſcum, which is drawn off and put into veſſels well glazed: From the remaining leys an inflammable ſpirit is made, little inferior, and ſometimes even ſuperior, to the European. Another kind of wine is uſed by the Chineſe, or rather Tartars, called *lamb wine*. It is very ſtrong, and has a diſagreeable ſmell; and the ſame may be believed of a kind of ſpirit diſtilled from the fleſh of ſheep; though this laſt is ſometimes uſed by the emperors.

Theſe entertainments exceed the bounds of ordinary repaſts; the Chineſe being naturally ſober, and thoſe in eaſy circumſtances living chiefly on pork; for which reaſon a great number of hogs are bred in the country. Their fleſh is much eaſier of digeſtion, and more agreeable to the taſte, than thoſe of Europe. The Chineſe hams are in high eſtimation. The common people live very poorly; being ſatisfied, in time of ſcarcity, with the fleſh of dogs, horſes, cats, and rats, which laſt are ſold publicly in the ſtreets.

116 Public feſtivals. There are ſeveral public feſtivals annually celebrated in China. One is that already mentioned, in which the emperor tills the ground with his own hands. This is alſo celebrated on the ſame day throughout the empire. In the morning the governor of every city comes forth

forth from his palace crowned with flowers, and enters his chair amidſt the noiſe of different inſtruments which precede it; a great number of people attending, as is uſual on all ſuch occaſions. The chair is ſurrounded by litters covered with ſilk carpets, on which are repreſented either ſome illuſtrious perſons who have ſupported and encouraged agriculture, or ſome hiſtorical painting on the ſame ſubject. The ſtreets are hung with carpets, triumphal arches are erected at certain diſtances, lanthorns everywhere diſplayed, and all the houſes illuminated. During the ceremony a figure reſembling a cow, made of baked earth, with gilt horns, is carried in proceſſion, and of ſuch enormous magnitude that 40 men are ſcarce ſufficient to ſupport it. A child follows with one foot naked and the other ſhod, who is called the *ſpirit of labour and diligence,* and keeps continually beating the image with a rod to make it advance. Labourers, with their implements of huſbandry, march behind; and the proceſſion is cloſed by a number of comedians and people in maſks. The governor advances towards the eaſtern gate, and returns in the ſame manner. The cow is then ſtripped of its ornaments, a prodigious number of earthen calves taken from its belly and diſtributed among the people; after which the large figure is broken in pieces and diſtributed in the ſame manner. The ceremony is ended by an oration in praiſe of agriculture, in which the governor endeavours to excite his hearers to the practice of that uſeful art.

Other two feſtivals are celebrated in China with ſtill more magnificence than that above deſcribed. One of them is at the commencement of the year; the other is called the *feaſt of lanthorns.* During the celebration of the former, all buſineſs, whether private or public, is ſuſpended, the tribunals are ſhut, the poſts ſtopped, preſents are given and received, and viſits paid. All the family aſſemble in the evening, and partake of a feaſt to which no ſtranger is admitted; though they become a little more ſociable on the following day.

The feaſt of lanthorns ought to take place on the 15th day of the firſt month, but uſually commences on the evening of the 13th, and does not end till that of the 16th. At that time every city and village, the ſhores of the ſea, and the banks of all the rivers, are hung with lanthorns of various ſhapes and ſizes; ſome of them being ſeen in the courts and windows of the pooreſt houſes. No expence is ſpared on this occaſion; and ſome of the rich people will lay out eight or nine pounds ſterling on one lanthorn. Some of theſe are very large, compoſed of ſix wooden frames either neatly painted or gilt, and filled up with pieces of fine tranſparent ſilk, upon which are painted flowers, animals, and human figures; others are blue, and made of a tranſparent kind of horn. Several lamps, and a great number of wax candles, are placed in the inſide: to the corners of each are fixed ſtreamers of ſilk and ſatin of different colours, with a curious piece of carved work on the top. They are likewiſe acquainted with our magic lanthorn, which they ſometimes introduce in this feſtival. Beſides this, they have the art of forming a ſnake 60 or 80 feet in length, filled with lights from one end to the other; which they cauſe twiſt itſelf into different forms, and move about as if it were a real ſerpent. During the ſame feſtival all the varieties of the Chineſe fire-works, ſo juſtly admired, and which, ſome time ago at leaſt, ſurpaſſed every thing of the kind that could be done in Europe, are exhibited.

117
Magnificence of the viceroys.

Every public ceremony in China is carefully rendered as ſtriking as poſſible. A viceroy never quits his palace but with a royal train, dreſſed in his robes of ceremony, and carried in a chair elegantly gilt, which is borne upon the ſhoulders of eight domeſtics; two drummers marching before the guards, and beating upon copper baſons to give notice of his approach. Eight other attendants carry ſtandards of wood varniſhed, upon which are inſcribed in large characters all his titles of honour. After theſe come 14 flags with the ſymbols of his office; ſuch as the dragon, tyger, phœnix, flying tortoiſe, &c. Six officers follow, each bearing a piece of board in ſhape like a large ſhovel, on which are written in large golden characters the qualities of the mandarin himſelf: two others carry, the one a large umbrella of yellow ſilk, and the other the cover in which the umbrella is kept. The firſt guards are preceded by two archers on horſeback; the latter are followed by others armed with a kind of weapons compoſed of hooked blades, fixed perpendicularly to long poles ornamented with four tufts of ſilk, placed at a ſmall diſtance above one another. Behind theſe are two other files of ſoldiers, ſome of whom carry large maces with long handles; others iron maces in the ſhape of a ſnake; others are armed with huge hammers; while thoſe behind them carry long battle-axes in the form of a creſcent: others follow, who have battle-axes of another kind; and behind theſe are ſome with the hooked weapons already deſcribed.

Behind theſe come ſoldiers armed with triple-pointed ſpears, arrows, or battle-axes; having in front two men who carry a kind of box containing the viceroy's ſeal. Then come two other drummers to give notice of his approach. Two officers follow, having on their heads felt hats, adorned with plumes of feathers, and each armed with a cane to recommend regularity and good order to the ſurrounding multitude. Two others bear maces in the form of gilt dragons. Theſe again are followed by a number of magiſtrates and officers of juſtice: ſome of whom carry whips or flat ſticks, while others have chains, hangers, and ſilk ſcarfs. Two ſtandard-bearers and a captain command this company, which immediately precede the governor. His chair is ſurrounded by pages and footmen, and an officer attends him who carries a large fan in form of a ſcreen; he is followed by ſeveral guards differently armed, together with enſigns and other officers, who are alſo followed by a great number of domeſtics all on horſeback, carrying various neceſſaries for the uſe of the mandarin. If he marches in the night-time, inſtead of flambeaux, as are cuſtomary in Europe, large lanthorns, exceedingly pretty, are carried before him; on the tranſparent part of which are written, in very conſpicuous characters, his quality, titles, and rank, as mandarin. Theſe are alſo intended to give notice to the paſſengers to ſtop, and to thoſe who are ſitting to riſe up with reſpect; for whoever neglects either the one or the other is ſure to receive a ſevere baſtinading.

The emperor marches with ſtill more magnificence, in proportion to his ſuperior quality. The trumpets uſed in this proceſſion are about three feet long, eight inches in diameter at the lower extremity, and pretty much reſembling a bell in ſhape: their ſound is peculiarly adapted to that of the drums. His cavalcade is cloſed by 2000 mandarins of letters, and as many of arms. Sometimes the great mandarins, as well as the emperor, travel in barks: their attendance is then ſomewhat different, but the magnificence almoſt the ſame. The honours paid to a viceroy who has governed a province with equity are exceedingly great on his departure from it. He has ſcarcely left the capital of the province when he finds on the highway, for the ſpace of two or three leagues, tables ranged at certain diſtances, each of which is ſurrounded with a long piece of ſilk that hangs down to the earth. On theſe wax candles are placed even in the open day; perfumes are burnt upon them; and they are loaded with a profuſion of victuals, and various kinds of fruit, while tea and wine are prepared for him on others. The people throw themſelves on their knees as he paſſes, and bow their heads even to the earth; ſome ſhed tears, or pretend to do ſo; ſome preſent him with wine and ſweetmeats; others frequently pull off his boots and give him new ones. Theſe boots, which he has perhaps uſed only for a moment, are conſidered as a valuable monument: thoſe firſt taken off are preſerved in a cage over the gate of the city; the reſt are carefully kept by his friends.

118 Knaviſh diſpoſition of the Chineſe.

Hitherto our author, M. Groſier, has ſeemed inclined to give a favourable idea of the Chineſe, and to cauſe us look upon them as many degrees ſuperior to ourſelves in the practice of virtue and morality; but when he comes to give an account of their dealings in trade, he is then obliged to confeſs that they are as diſhoneſt and knaviſh a race as any that exiſt. "The moſt frequented fairs of Europe (ſays he) afford but a faint idea of that immenſe number of buyers and ſellers with which the large cities of China are continually crowded. We may almoſt ſay, that the one half are employed in over-reaching the other. It is, above all, againſt ſtrangers that the Chineſe merchants exerciſe, without any ſenſe of ſhame, their inſatiable rapacity. Of this F. du Halde gives a ſtriking example, which might be ſupported by many others: 'The captain of an Engliſh veſſel bargained with a Chineſe merchant at Canton for ſeveral bales of ſilk, which the latter was to provide againſt a certain time. When they were ready, the captain went with his interpreter to the houſe of the Chineſe merchant to examine whether they were ſound and in good condition. On opening the firſt bale, he found it according to his wiſh, but all the reſt were damaged and good for nothing. The captain on this fell into a great paſſion, and reproached the merchant in the ſevereſt terms for his diſhoneſty. The Chineſe, after having heard him for ſome time, with great coolneſs, replied, 'Blame, Sir, your knave of an interpreter: he aſſured me that you would not inſpect the bales.'

"The lower claſs of people are, above all, very dexterous in counterfeiting and adulterating every thing they ſell. Sometimes you think you have bought a capon, and you receive nothing but ſkin; all the reſt has been ſcooped out, and the place ſo ingeniouſly filled, that the deception cannot be diſcovered till the moment you begin to eat it. The counterfeit hams of China have been often mentioned. They are made of a piece of wood cut in the form of a ham, and coated over with a certain kind of earth which is covered with hog's ſkin. The whole is ſo curiouſly painted and prepared, that a knife is neceſſary to detect the fraud. Mr Oſbeck relates, that having one day obſerved a blind man carrying about for ſale ſome of thoſe trees called by the Chineſe *Fokei*, he purchaſed one, which to appearance had fine double red and white flowers; but on cloſer examination, he found that the flowers were taken from another tree, and that one calyx was ſo neatly fitted into the other, with nails made of bamboo, that he ſhould ſcarcely have diſcovered the deceit had not the flowers begun to wither. The tree itſelf had buds, but not one open flower.

"The robbers in China ſignalize themſelves alſo by the dexterity and ingenuity which they diſplay in their profeſſion. They ſeldom have recourſe to acts of violence, but introduce themſelves into a houſe either privately or by forming ſome connection with the family. It is as difficult in China to avoid robbery as it is to apprehend the criminal in the fact. If we are deſirous of finding among the Chineſe openneſs of temper, benevolence, friendſhip, and, laſtly, virtue, we muſt not ſeek for it in cities, but in the boſom of the country, among that claſs of men who have devoted themſelves to labour and agriculture. A Chineſe ruſtic often diſcovers moral qualities which would add a luſtre to the character of men of the moſt exalted rank. It appears that rural life naturally inſpires ſentiments of benevolence; by continually receiving the gifts of nature, the mind is enlarged, and men are inſenſibly accuſtomed to diffuſe them to thoſe around them."

The internal commerce of China is much greater than that of all Europe; but its foreign trade is by no means equal to that of any of the grand European powers. Its internal commerce is greatly facilitated by the vaſt number of canals and rivers with which the country is interſected. The Chineſe, however, are not at all fitted for maritime commerce: Few of their veſſels go beyond the ſtraits of Sunda; their longeſt voyages to Malacca extended only as far as Acheen, towards the ſtraits of Batavia, and northward to Japan.

Their commerce with the laſt mentioned iſland, conſidering the article of exchange, which they procure at Camboya or Siam, produces them cent. per cent. Their trade with the Manillas brings only about 50 per cent. Their profit is more conſiderable about Batavia; and the Dutch ſpare no pains to invite them to traffic at their ſettlements. The Chineſe traders go alſo, though not very frequently, to Acheen, Malacca, Thor, Patan, and Ligor, belonging to Siam and Cochin china; from whence they bring gold and tin, together with ſome objects of luxury for the table. A great obſtacle to the foreign commerce of the Chineſe is their indifference about maritime affairs, and the bad conſtruction of their veſſels. This they themſelves acknowledge; but ſay, that any attempt to remove it would be derogating from the laws, and ſubverting the conſtitution of the empire.

119 Burying-places deſcribed.

The burying-places in China are always ſituated at a ſmall diſtance from a city or town, and generally upon ſome eminence, having pines or cypreſſes uſually planted around them. The form of the tombs is various according to the different provinces, and the ſituation of thoſe for whom they are intended. The coffins of the poor are placed under a ſhade covered with thatch, or incloſed in a ſmall building of brick in the form of a tomb. The tombs of the rich are ſhaped like a horſe-ſhoe, well whitened, and finiſhed with great taſte; but thoſe of the mandarins and people of quality are much more ſumptuous and elegant. A vault is firſt conſtructed, in which the coffin is ſhut up; over this vault is raiſed a pyramid of earth well beat together, about 12 feet in height and 10 in diameter. A layer of lime and ſand laid over this earth makes a kind of plaſter, which renders the whole very durable and ſolid; various kinds of trees being planted around it in regular order. Before it is placed a large and long table of white marble, on the middle of which is ſet a cenſer, accompanied with two vaſes, and the ſame number of candleſticks of exquiſite workmanſhip. Beſides this a great number of figures, repreſenting officers, eunuchs, ſoldiers, ſaddled horſes, camels, lions, tortoiſes, &c. are ranged round the tombs in different rows; which, F. du Halde aſſures us, produces a very ſtriking effect.

When a Chineſe dies in a province in which he was not born, his children have a right, nay it is their indiſpenſable duty, to tranſport the body to the burying-place of their anceſtors. A ſon, who ſhould be wanting in this reſpect, would be diſgraced, and his name never placed in the hall of his anceſtors. This is a vaſt building, conſidered as a common to all the branches of the ſame family, and to which they all repair at a certain ſeaſon of the year. Sometimes they amount to ſeven or eight thouſand perſons, whoſe fortune, dignity, and rank in ſociety, are all very different; but there no diſtinction of rank is known; age only gives precedence, and the oldeſt always takes place of all the reſt, though he ſhould be the pooreſt in the company. The diſtinguiſhing ornament of this hall is a long table ſet againſt the wall, upon which is generally ſeen the image of one of their anceſtors, who has filled ſome office of diſtinction in the empire with honour to himſelf, or who has been rendered illuſtrious by his talents and abilities. Sometimes it only contains the names of men, women, and children, belonging to the family, inſcribed upon tablets, together with their age, the day of their death, and the dignities they enjoyed at that time. Theſe tablets are ranged in two rows upon ſteps, and are only about a foot high each. In the ſpring, and ſometimes in the autumn, the relations of the deceaſed repair to this hall, where the only privilege enjoyed by the richeſt is that of preparing an entertainment, and treating the whole family at their own expence; but they never allow themſelves to taſte a bit of any thing until an offering has been firſt made to their anceſtors. This does not, however, excuſe them from viſiting the real tomb of their anceſtors once or twice a year, generally in the month of April. At this time they pluck the weeds and buſhes from around the tomb, renew their expreſſions of grief, and conclude by placing upon it wine and proviſions, which ſerve to dine their aſſiſtants.

120
Funeral ceremonies.

The funeral ceremonies are conſidered by the Chineſe as the moſt important of any. A few moments after a perſon has expired, he is dreſſed out in his richeſt attire, and adorned with every badge of his dignity; after which he is placed in the coffin. The preparation of a coffin, in which his body may be incloſed after death, is one of the chief objects of attention to a Chineſe during his life, and great expence is often thrown out upon it; inſomuch that the poor will give all they are worth, and the rich expend a thouſand crowns, nay, a ſon will ſell himſelf for a ſlave in order to purchaſe a coffin for his father. Sometimes the coffin, when purchaſed with all this labour and expence, will remain twenty years uſeleſs in the family, and is conſidered as the moſt valuable piece of furniture in his poſſeſſion.

The manner of interment is as follows: Firſt they ſprinkle ſome lime in the bottom of the coffin; then they lay the body in it, taking care to place the head on a pillow, and to add a great deal of cotton, that it may remain more ſteady, and be prevented from ſhaking. In this manner the body remains expoſed ſeven days; but the time may be reduced to three, if any weighty reaſon makes it neceſſary; and, during this interval, all the relations and friends, who are purpoſely invited, come and pay their reſpects to the deceaſed, the neareſt relations even remaining in the houſe. The coffin is expoſed in the hall of ceremony, which is then hung with white, but ſome pieces of black or violet-coloured ſilk are here and there interſperſed, as well as ſome other ornaments of mourning. Before the coffin is placed a table, on which ſtands the image of the deceaſed, or a carved ornament inſcribed with his name; and theſe are always accompanied with flowers, perfumes, and lighted wax candles.

In the mean time thoſe who enter the hall are accuſtomed to ſalute the deceaſed as if he were ſtill in life. They proſtrate themſelves before the table, and knock their foreheads ſeveral times againſt the earth; after which they place on the table ſome perfumes and wax candles provided for the purpoſe. The ſalutation which they have made to the deceaſed is returned by the eldeſt ſon accompanied by his brothers. The latter come forth from behind a curtain, which hangs on one ſide of the coffin, creeping along the ground until they reach the ſpot where thoſe ſtand whom they are going to ſalute; after which, without riſing up, they return to the place from whence they came. The women are alſo concealed behind the ſame curtain, from whence they every now and then ſend forth diſmal cries.

After a number of ceremonies and invitations, the funeral proceſſion at laſt commences. A troop of men march in a file, carrying different figures made of paſteboard, and repreſenting ſlaves, lions, tigers, horſes, &c. Others follow, marching in two files; ſome of which carry ſtandards, ſome flags or cenſers filled with perfumes; while melancholy and plaintive airs are played by others on different muſical inſtruments. Theſe muſicians immediately precede the coffin, which is covered with a canopy, in form of a dome, of violet-coloured ſilk; its four corners are ornamented with tufts of white ſilk very neatly embroidered, and covered at the top with net-work. The coffin is placed on the bottom of this machine, and is carried by 64 men. The eldeſt ſon, clothed in a frock of canvas, having his body bent and leaning on a ſtaff, follows near the coffin; and behind him his brothers and nephews, but none of them clothed in canvas. Then come the relations and friends, all clad in mourning, and followed by a great number of chairs covered with white ſtuff, which contain the wives and female ſlaves of the deceaſed. Theſe make great ſhow of ſorrow by their doleful cries; but M. Groſier obſerves, that, in ſpite of all they can do, the lamentations of the Chineſe are ſo methodical, that an European would be apt to conclude that they were the effects of art rather than the natural effuſions of a mind agitated and oppreſſed with grief. When they arrive at the burying place, the coffin is depoſited in a tomb appropriated for it, not far from which there are tables arranged in different halls, and on which the aſſiſtants are entertained with great ſplendour. The entertainment is ſometimes followed by freſh marks of homage to the corpſe; but theſe are often changed into thanks to the eldeſt ſon; who, however, anſwers only by ſigns. But if the deceaſed was a grandee of the empire, a certain number of his relations never leave the tomb for a month or two. There they reſide in apartments purpoſely provided for them, and every day renew their marks of grief in company with the children of the deceaſed. The magnificence of theſe funeral ceremonies is proportioned to the wealth or dignity of the deceaſed. That of one of the brothers of the emperor was attended by 16,000 people, each of whom had a particular office aſſigned him relating to the ceremony.

121 Mourning. Mourning continues in China for three years; and during all this time they are obliged to abſtain from the uſe of fleſh and wine; nor can they aſſiſt at any entertainment of ceremony, or attend any public aſſembly. At firſt they are not even permitted to go abroad; and when they do ſo they are carried in a chair covered with a white cloth. Sometimes the filial piety of the Chineſe is carried to ſuch a length, that they preſerve the bodies of their deceaſed fathers in their houſes for three or four years; and thoſe who do ſo impoſe alſo upon themſelves a great number of other duties, uſing no other ſeat during the day but a ſtool covered with white ſerge, and no other bed but a plain mat made of reeds, which is placed near the coffin.

122 Diverſions of hunting and fiſhing. According to M. Groſier, the only diverſions of the Chineſe are thoſe of hunting and fiſhing, dancing not being practiſed, and gaming forbidden by law. Fiſhing is conſidered by them rather as an object of commerce and induſtry than amuſement. They catch fiſh by various methods; uſing nets in their great fiſheries, but lines in the private. In certain provinces alſo they uſe a certain kind of bird whoſe plumage greatly reſembles that of a raven, but with a much longer bill, very ſharp and hooked. This method of fiſhing is practiſed in boats, of which great numbers may be ſeen on the river about ſun-riſing, with the fiſhing-birds perched on their prows. Theſe birds are taught to catch fiſh almoſt in the ſame manner that dogs purſue game. The fiſhermen, after making ſeveral turns with their boats, beat the water ſtrongly with one of their oars. This ſerves as a ſignal to the birds, who inſtantly plunge into the water, and diving, ſwallow as many ſmall fiſhes as they can, repairing immediately afterwards to the boat, and carrying a large one by the middle in their bill. The ſmall ones are prevented from paſſing into the ſtomach by a ring placed on purpoſe to confine its gullet: and thus the fiſherman by ſtroaking its neck with the head downwards, makes the bird diſgorge all thoſe ſmall fiſh it has ſwallowed. When they have done fiſhing, the rings are taken off, and the birds allowed to feed. When the fiſh happens to be too large for a ſingle bird, the others have ſagacity enough to aſſiſt it; one taking it by the tail, another by the head, &c. and thus they tranſport it to their maſter.

Another method of fiſhing, practiſed only in China, is as follows: They nail a board about two feet in breadth, which is covered with a white ſhining kind of varniſh, upon the edges of a long narrow boat, from one end to the other. This board is placed in ſuch a manner as to ſlope almoſt imperceptibly to the water. It is uſed only in the night-time, and is always turned towards the moon, that the reflection of light from the luminary may increaſe the ſplendour of the varniſh. The fiſh in ſporting, often miſtake this varniſhed board for water; and endeavouring to throw themſelves into it, fall into the boat.

The ſoldiers have a particular method of fiſhing with a bow and an arrow; the latter of which is fixed to the bow by a ſtring, both to prevent it from being loſt, and to enable them to draw out the fiſh which the arrow has pierced; others make uſe of tridents to catch large fiſh which are ſometimes found in the mud.

Beſides theſe diverſions the Chineſe have ſome ſtrolling players, but no regular theatres; they have likewiſe muſicians and ſingers, but no operas, or indeed any public ſpectacle worthy of notice.

12 Of the Chineſe language. The language of the Chineſe is not only very ancient, but, in M. Groſier's opinion, is ſtill ſpoken as in the moſt early ages without any variation. His reaſons for this opinion are, 1. We do not perceive in hiſtory, nor even in the moſt fabulous traditions, a ſingle fact tending to occaſion any doubt of the language ſpoken by the ancient Chineſe being different from that uſed at preſent. 2. China has never changed its inhabitants; and if revolutions have occaſioned any mixture of new languages, it appears that the ancient language has always been predominant, and that the new ſettlers have learned and ſpoken it, as the Manchew Tartars after their conqueſt. 3. The moſt intelligent and diſcerning of the literati agree, that the firſt chapters of the *Chou-king* were written under the reign of Yao, 2300 years before Chriſt; and in theſe ſeveral ſpeeches of the firſt emperors are related word for word; and it is not probable that the language of theſe princes was different from that of the hiſtorian. 4. A compliment paid to Yao by one of his ſubjects, with the anſwer of that prince, are ſtill preſerved, as well as two ſongs compoſed under the ſame reign. 5. The moſt ancient inſcriptions in China are all in the language ſpoken throughout the empire at this day. 6. The Chineſe have borrowed nothing from other nations; and their attachment to their own cuſtoms, and to antiquity, muſt undoubtedly be very unfavourable to any innovation. The language ſpoken by the vulgar, indeed, muſt have undergone ſome changes; but theſe may be accounted trivial, affecting

only the pronunciation; which indeed appears to be varied in ſome few inſtances. It is certain, however, that the Chineſe players act theatrical pieces which were written 1000 years ago, and that theſe are ſtill underſtood throughout the empire.

The language of China has no alphabet; all the words which compoſe it conſiſt of one ſyllable only, and are very few in number. Theſe always remain the ſame, and continue monoſyllables even when two are joined together, being united in the ſame manner as the French words *bon* and *jour* are united to form *bon-jour*. Theſe monoſyllables never form but one ſound. When written by an European, they begin with the letters *ch*, *tch*, *ſ*, *g*, or *j*, *i*, *h*, *l*, *m*, *n*, *g*, *ng*, *p*, *ſ*, *ts*, *v*, *ou*; the final letters being *a*, *e*, *i*, *o*, *oi*, *ou*, *u*, *l*, *n*, *gn*. The middle of Chineſe words conſiſts of vowels and conſonants producing only one ſound, and pronounced always as monoſyllables. The whole primary words of the language are in number only about 330, though ſome dictionaries make them 484. The ſenſe of theſe words, however, is varied by the accents and changes of the voice in pronouncing them almoſt *ad infinitum*. Two principal accents are known in China; the *ping*, that is, *even*, without elevating or depreſſing the voice. This divided into *tſing*, *clear*, and *tcho*, *obſcure*; or rather *open* and *mute*. The accent *tſe* is ſubdivided into *tchang*, ſharp, *kiu*, grave; and *jou*, re-entering. The tone is *chang* when one raiſes the voice at the end of a word, as when the negative *no* is pronounced with great emphaſis and force; it is *kiu* when one depreſſes the voice with an air of timidity. When the accent is *jou*, the voice is drawn back as it were into the throat; and the aſpiration which takes place on certain words beginning with the letters *c*, *k*, *p*, *t*, ſtill adds to theſe varieties.

By theſe differences in pronunciation the ſignification of the words is totally changed: thus the word *tchu* pronounced by lengthening the *u*, and with a clear tone of voice, ſignifies *maſter* or *lord*: if it is pronounced in an uniform tone by lengthening the *u*, it ſignifies *hog*: when pronounced lightly and with rapidity, it ſignifies *kitchen*; and when articulated with a ſtrong voice depreſſed towards the end, it ſignifies a *pillar*.

By the conjunction and modification of theſe different monoſyllables, a Chineſe can expreſs every thing he has occaſion for; and it may be eaſily ſeen what variety muſt reſult from this art of multiplying words. The Chineſe language therefore has words expreſſive of the ſmalleſt variation of circumſtance, and which cannot be expreſſed in the European languages without a circumlocution. Thus inſtead of the five words, calf, bull, ox, heifer, cow, every time that a cow has a calf ſhe acquires a new name in the language of this empire; and ſtill another when ſhe becomes barren. An ox fed for ſacrifice has a particular name, which is changed when he goes to the altar. In like manner, a whole dictionary might be compoſed of the words that are employed to expreſs the different parts of the emperor's palace, and thoſe that are in a manner conſecrated to it; others being employed when the palaces of princes or mandarins are ſpoken of. Thus the number of their characters are augmented beyond all bounds, ſo that the greater part of their literati ſpend all their lives in ſtudying them.

In the Chineſe there are four different languages, 1. The *Kou-ouen*, or claſſical language. This is not ſpoken at preſent, though it is generally believed to have been the language of the early ages. It is ſo laconic, and the ideas are ſo crowded, that it is very difficult to be underſtood; however, the literati, who can read and underſtand it, are much delighted with it. 2. The *Ouen-tchang* is the language uſed in compoſitions where a noble and elevated ſtyle is requiſite. It is never ſpoken, but certain ſentences and complimentary expreſſions are ſometimes borrowed from it. It aproaches near to the laconic brevity and majeſtic ſolemnity of the *Kou-ouen*, and is equally proper for every kind of ſubject, excepting only the ambiguities of metaphyſics, and the formal rugged diction uſed in treating of the abſtract ſciences.

3. The *Kouan-ha* is the language of the court, of people in office, and of the literati. It admits of ſynonymous expreſſions to moderate the brevity of monoſyllables; of pronouns and relatives; prepoſitions, adverbs, and particles; to ſupply the want of caſes, moods, tenſes, and numbers, which have place in other languages.

4. *Hing-tan* is a kind of currupted language, or provincial dialect, ſpoken by the lower claſſes in China; and of which every province, city, and almoſt every village, has its own. Beſides the ſenſe of the words, which is changed in a great variety of places, they are ſo altered by diverſity of pronunciation as to be almoſt unintelligible.

This language is ſo abſolutely original, that no traces of the moſt diſtant relation can be perceived, either in reference to the form of the character, the ſyſtem on which it appears to have been conſtructed, or its peculiar idiom to any other known language to be met with upon the face of the earth. Many attempts indeed have been made by the learned and ingenious, to diſcover ſome affinity between it and different languages; but we apprehend without ſucceſs. Etymological compariſons are often fanciful and ſtrained, and ſeldom fail to lead to erroneous concluſions. It may indeed be admitted that it is poſſible to trace a reſemblance between the ſound of the Chineſe language, and thoſe of other nations, yet no art or ingenuity, no *etymological trick*, as Mr Barrow expreſſes himſelf, will ever be able to trace any analogy between their written characters, farther than that they are made up of points and lines, which might conſtitute an affinity between the Chineſe and any other language on the face of the earth. It has no alphabetical arrangement, but conſiſts purely of a prodigious number of arbitrary ſigns, ſettled by convention, and which have no external affinity to the things they are meant to deſcribe. The ridiculous conjectures often made on this ſubject by etymologiſts might be pardoned if they were meant to be ſatirical, like Dean Swift's antiquity of the Engliſh tongue, from which he makes the Hebrew, Greek, and Latin, to be derivatives.

Such is the nature of the Chineſe language, that it would be abſurd to expect among that people ſuch high attainments in every branch of literature as are to be met with in Europe. In the opinion of ſome very eminent men, their acquaintance with erudition of any kind was as great 2000 years ago as it is at preſent, while others are perſuaded that they are rather on the decline. They pretend indeed, but without adducing any ſatisfactory proof of its truth, that the monuments of literature were deſtroyed by the tyrant She-whangte, 200 years before the Chriſtian era, that ſucceeding generations might conſider him as the firſt civilized emperor who had ſwayed the ſcepter over that extenſive country. The chief works at preſent among them, which are moſt valued, ſtudied, and leaſt underſtood, are the five claſſics collected by their favourite Cong-foo-tſe, 450 years B. C. and which it ſeems had the good fortune to eſcape the unlettered fury of She-whang-te. Theſe claſſics are enumerated by Mr Barrow in the following order.

1. *Shoo-king.* A collection of records and annals of various princes, commencing more than 2000 years B. C.

2. *She king.* Odes, ſonnets, and maxims; moſt of them ſo abundant in metaphor, and ſo obſcure, that much of the ſenſe is to be made out by the tranſlator.

3. *Ye king.* The perfect and the broken lines of Fo-ſhee; the moſt ancient relick in China, and perhaps the firſt attempt at written language: now perfectly incomprehenſible.

4. *Chung-choo.* Spring and autumn. The hiſtory of ſome of the kings of Loo: the work principally of Cong-foo-tſe.

5. *Lee-kee.* Ceremonies and moral duties, a compilation of Cong-foo-tſe.

Without a complete change of the Chineſe language and a more extenſive and friendly intercourſe with foreign nations, it is not at all probable that that people will ever rank high for their knowledge of literature.

124 Chineſe writing.

There are five kinds of writing mentioned by the Chineſe literati; the moſt modern of which is a method of tracing out the characters with a pencil. This is difficult, and requires much experience; at any rate, it disfigures the characters greatly, and is therefore only uſed in the preſcriptions of phyſicians, prefaces to books, and inſcriptions of fancy. The tracing of characters with neatneſs and accuracy, however, as we have already had occaſion to obſerve, is greatly admired in China. They are often preferred to the moſt elegant painting; and ſome will give a moſt exorbitant price for a page of an old book, if it happens to be neatly written. They pay particular attention to well formed characters even in the moſt common books; and if any of the leaves happen to fall off, will replace them with the greateſt attention. To apply them to any vile purpoſe, tread them under foot, &c. would be reckoned an unpardonable violation of decency and politeneſs; nay, it often happens, that workmen, ſuch as maſons and joiners, dare not tear a printed leaf of paper fixed to the wall.

125 Of their poetry.

Punctuation was not formerly uſed in China, nor are points as yet employed in works of an elevated ſtyle, or ſuch as are to be preſented to the emperor. Poetry is ſeldom an object of attention, though the taſte for it ſeems to be pretty general in China. Their verſification has its rules, and is no leſs difficult than that of other nations. Only the moſt harmonious, energetic, and pictureſque words, are to be employed, and they muſt always be uſed in the ſame ſenſe in which they were uſed by the ancients. Each verſe can contain only a certain number of words; all of which muſt be ranged according to the rules of quantity, and terminate in rhyme. The number of verſes in a ſtrophe is not determined; but they muſt be uniform, and preſent the ſame diſtribution of rhymes. The ſmall number of poetical expreſſions contained in the Chineſe language has rendered it neceſſary to extend the poetical licence to a great length in this reſpect. The Chineſe poets are allowed to employ a blank verſe in every four. They are acquainted with moſt kinds of poetry in uſe among us. They have ſtanzas, odes, elegies, idyls, eclogues, epigrams, ſatires, and even *bouts rimes*. The common people have alſo ballads and ſongs peculiar to themſelves. Some of the moſt diſtinguiſhed of the literati have even thought it of importance enough to turn the moſt celebrated maxims of morality, with the rules of civility, into verſe. Their poetry is ſeldom diſgraced by any kind of obſcenity; and indeed any ſuch thing would be ſeverely puniſhed by government. That ſevere attention with which every thing tending to corrupt the morals is watched in China, prohibits not only poems of this kind, but likewiſe romances of all ſorts. The police, however, permits ſuch novels as have an uſeful tendency, and in which nothing is introduced prejudicial to ſound morality. Every author who writes againſt government is puniſhed with death, as well as all thoſe who have had any hand in the printing or diſtribution of his works.

126 Chineſe paper.

The arts of making paper and printing have been long known among the Chineſe. That kind of paper now in uſe was firſt manufactured about 105 years before the Chriſtian era. Before that period they uſed cloth, and various kinds of ſilk ſtuff, inſtead of paper; and to this day they ſtill preſerve a cuſtom of writing the praiſes of the dead upon large pieces of ſilk, which are ſuſpended on one ſide of the coffin, and carried in funeral proceſſions; and of ornamenting their apartments with maxims and moral ſentences written in the ſame manner. In ages ſtill more early, they wrote with a kind of ſtyle upon pieces of bamboo, or even upon plates of metal. The firſt paper was invented by a mandarin. He took the bark of trees, hemp, and old pieces of ſilk-ſtuff, boiling them together until they were reduced to a kind of paſte, of which he formed his paper; which by degrees was brought to perfection, and the art of whitening and giving it a luſtre found out. A great number of different ſubſtances are now uſed in this empire for making paper; ſuch as the bamboo reed, the cotton ſhrub, the bark of the plant called *kou-chu*, and of the mulberry tree; hemp, the ſtraw of wheat and rice, parchment, the cods of the ſilk-worm, and ſeveral other ſubſtances unknown in Europe. In this manufacture the bark of trees and ſhrubs is uſed, and the woody ſubſtance of the bamboo and cotton tree, after it has been macerated and reduced to a thin paſte. Moſt of the Chineſe paper, however, is attended with the diſadvantage of being very ſuſceptible of moiſture, readily attracts the duſt, and worms inſenſibly get into it: to prevent which inconveniences, it is neceſſary to beat the books often, and expoſe them to the ſun. That made of cotton is the pretteſt, and moſt uſed of any. All of them, however, are much ſofter and ſmoother than ours; which is abſolutely neceſſary for their method of writing with

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a pencil, in order that it may run with freedom, which it could not do upon ours. It is formed into ſheets of an enormous ſize; ſo that it would be no difficult matter to procure from the manufactories of this empire ſheets of paper 30 or 40 feet long.

127 k. The Chineſe ink came originally from Corea; and it was not until the year 900, that they hit upon the method of making it to perfection. The beſt is made in *Hcei-tcheou* in the province of *Kiang-nan;* but its compoſition is a ſecret, which the workmen conceal not only from ſtrangers but from their fellow-citizens. When a Chineſe has occaſion to write, he places upon his table a piece of poliſhed marble, having a cavity at one of its extremities to contain a little water. In this he dips the end of his cake of ink, and rubs it upon the ſmooth part of the marble; and as he preſſes more or leſs ſtrongly, the liquor acquires a deeper or lighter tinge of black. When he has done writing, the ſtone is carefully waſhed; for it would be diſhonoured by allowing the leaſt ſpot to remain. The pencils uſed in writing are commonly made of the fur of a rabbit, and conſequently very ſoft.

128 heir me- od of inting. The Chineſe method of printing is exceedingly different from ours; and indeed it would be in a manner impoſſible to have moveable types for ſuch a number of characters as their language requires. The whole work which they intend to print is therefore engraved upon blocks of wood; and their method of proceeding is as follows. They firſt employ an excellent writer, who tranſcribes the whole upon very thin paper. The engraver glues each of the leaves of the manuſcript upon a piece of plank made of any hard wood: he then traces over with a graver the ſtrokes of the writing, carves out the characters in relief, and cuts down the intermediate part of the wood. Thus each page of a book requires a ſeparate plank; and the exceſſive multiplication of theſe is no doubt a very great inconvenience, one chamber being ſcarce ſufficient to preſerve thoſe employed for a ſingle book. The advantages are, that the work is thus free from typographical errors, and the author has no occaſion to correct the proofs. Thus alſo the bookſellers in China have a decided advantage over thoſe of Europe, as they are able by this method of printing to throw off copies according to their ſale, without running the riſk of being ruined by too large an edition. In this method the beauty of the work depends entirely upon the ſkill of the writer previouſly employed. The engravers are exceedingly dexterous, and imitate every ſtroke ſo exactly, that it is ſometimes difficult to diſtinguiſh a printed work from one that is only written.

The method of printing in China is not by a preſs as in Europe, as neither their wooden planks nor their ſoft paper could ſuſtain ſo much preſſure. They firſt place the plank level, and then fix it in that poſition. The printer is provided with two bruſhes, and with the hardeſt daubs the plank with ink; and one daubing is ſufficient for four or five leaves. After a leaf has been adjuſted upon the plank, the workman takes the ſecond bruſh, which is ſofter than the former, and of an oblong figure, and draws it gently over the paper, preſſing it down a little, that it may receive the ink. The degree of preſſure is to be regulated by the quantity of ink upon the plank: and in this manner one man is able to throw off almoſt 10,000 copies a day. The ink uſed for printing is different from that formerly deſcribed, and which is uſed in writing. The leaves, on account of the thinneſs of the paper, are printed only upon one ſide; on which account each leaf of a book is double, ſo that the fold ſtands uppermoſt, and the opening is towards the back, where it is ſtitched. Hence the Chineſe books are not cut on the edges, but on the back. They are generally bound in gray paſteboard, which is very neat; and thoſe who wiſh to have them more elegantly done, get the paſteboard covered with ſatin, flowered taffety, and ſometimes with gold and ſilver brocade. Their books are neither gilt nor coloured on the edges like ours.

It has been ſo juſtly and ſo frequently obſerved, that the liberty of the preſs muſt ever prove fatal to the exiſtence of tyranny and ſuperſtition, that it is a circumſtance peculiarly ſingular to behold the liberty of the preſs flouriſhing under a deſpotic government; yet this is actually the caſe in China, although its government may be ſaid to be founded on error, and ſupported by oppreſſion. It was the liberty of the preſs which accompliſhed the overthrow of ſacerdotal tyranny in many European countries, by enlightening the minds of thoſe who were enſlaved. When the art of printing firſt found its way into England, an intelligent perſon obſerved to the abbot of Weſtminſter, "If you don't take care to deſtroy that machine, it will very ſoon deſtroy your trade." It was fortunate, however, for ſucceeding generations, that neither the abbot nor his ſanctified cotemporaries had the penetration to diſcover the truth of this prediction, elſe the ages of darkneſs and ſuperſtition would probably have been protracted to the preſent day.

129 Vaſt quantity of ſilk produced. The art of manufacturing ſilk, according to the beſt authorities, was communicated by the Chineſe to the Perſians, and from them to the Greeks. The art has been known in this empire from the remoteſt antiquity; and the breeding of ſilk-worms and making of ſilk was one of the employments even of the empreſſes in very early ages.

The moſt beautiful ſilk in the whole empire is that of *Tche-kiang*, which is wrought by the manufactories of Nanking. From theſe are brought all the ſtuffs uſed by the emperor, and ſuch as he diſtributes in preſents to his nobility. A great number of excellent workmen are alſo drawn to the manufactories of Canton by the commerce with Europe and other parts of Aſia. Here are manufactured ribbons, ſtockings, and buttons. A pair of ſilk ſtockings here coſt little more than 6s. ſterling.

The quantity of ſilk produced in China ſeems to be almoſt inexhauſtible; the internal conſumption alone being incredibly great, beſides that which is exported in the commerce with Europe and the reſt of Aſia. In this empire all who poſſeſs a moderate fortune wear ſilk clothes; none but the lower claſs of people wearing cotten ſtuffs, which are commonly dyed blue. The principal ſtuffs manufactured by them are plain and flowered gauzes, of which they make ſummer-dreſſes; damaſk of all colours; ſtriped and black ſatins; naped, flowered, ſtriped, clouded, and pinked taffeties; crapes, brocades, pluſh, different kinds of velvet, and a multitude of other ſtuffs unknown in Europe. They make particular uſe of two kinds; one named *touan-tſe*, a kind of ſatin much ſtronger, but which has leſs luſtre, than that of Europe; the other a kind of taffety, of which they make drawers and linings. It is woven exceedingly cloſe, and is yet ſo pliable that it may be rumpled and rubbed between the hands without any creaſe; and even when waſhed like cotton cloth, it loſes very little of its luſtre. They manufacture alſo a kind of gold brocades, but of ſuch a ſlight nature, that they cannot be worn in clothes: they are fabricated by wrapping fine ſlips of gilt paper round the threads of ſilk.

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Porcelain.

Porcelain is another great branch of Chineſe manufacture, and employs a vaſt number of workmen. The fineſt is made in a village called *King-te-Ching* in the province of *Kiang ſi*. Manufactories have alſo been erected in the provinces of Fo-kien and Canton, but their produce is not eſteemed: and one which the emperor cauſed to be erected at Peking, in order to be under his own inſpection, miſcarried entirely.

The Chineſe divide their porcelain into ſeveral claſſes, according to its different degrees of fineneſs and beauty. The whole of the firſt is reſerved for the uſe of the emperor, ſo that none of it ever comes into the hands of other perſons, unleſs it happen to be cracked or otherwiſe damaged in ſuch a manner as to be unworthy of being preſented to the ſovereign. Among that ſent to the emperor, however, there is ſome porcelain of an inferior quality, which he diſpoſes of in preſents. There is ſome doubt, therefore, whether any of the fineſt Chineſe porcelain was ever ſeen in Europe. Some value, however, is now put upon the European porcelain by the Chineſe themſelves.

131
Glaſs of little eſtimation.

The uſe of glaſs is very ancient in China, though it does not appear that great value was ever put upon this kind of ware, the art of manufacturing it having been frequently loſt and revived again in this empire. They greatly admire the workmanſhip of the European cryſtal, but prefer their own porcelain, which ſtands hot liquors, and is much leſs liable to be broken. The little eſtimation in which this ſubſtance was held, is even mentioned by their own writers in ſpeaking of the falſe pearls, mirrors, and other toys which were made in former ages. The remembrance of a very large glaſs veſſel, however, which was made in 627, is ſtill preſerved; and of which it was ſaid that a mule could as eaſily enter it as a gnat could enter a pitcher. In order to tranſport this monſtrous veſſel from the place where it was manufactured to the emperor's palace, it was neceſſary to incloſe it in a net, the four corners of which were fixed to four carriages. The ſame indifference with regard to glaſs is ſtill entertained by the preſent emperors; however, a glaſs-houſe is eſtabliſhed at Peking, where a number of vaſes and other works are made; and theſe are ſo much the more difficult in the execution, as none of them are blown. This manufactory, as well as many others, is conſidered only as an appendage of the court, deſtined for the purpoſes of pomp and magnificence.

132
Medicine.

It ſeems evident that medicine muſt have been one of the earlieſt ſtudies to which mankind turned their attention, at leaſt when they had attained to ſome degree of civilization. It is the common lot of humanity to be born to trouble as the ſparks fly upward, and therefore an aſſiduous application to the ſtudy of thoſe diſeaſes to which man is ſubject, either with a view to effect a radical cure, or even to mitigate the virulence of their ſymptoms, muſt have ſecured to ſuch characters the eſteem and admiration of the world. Even ſavages have diſcovered reſpect for ſuch of their own nation as could remove obſtructions, heal bruiſes, or adminiſter relief to the miſerable in any ſhape whatever. The Chineſe in this reſpect are perfectly unique, and ſeem to differ from every nation under heaven in their notions of medicine. They have no public ſeminaries where the healing art may be taught, becauſe they do not conſider the knowledge of any branch of medicine as in the ſmalleſt degree neceſſary. The very beſt performances of this nature to be met with in China, are little more than mere enumerations of the names and ſuppoſed qualities of different plants,—a ſufficient ſtock of knowledge for conſtituting a Chineſe phyſician. In a country where the people are ſo credulous, and the medical art at ſuch a low ebb, it would be a ſingular circumſtance to find no quacks. In every city, therefore, of this vaſt empire, multitudes are to be met with continually vending noſtrums, as pretended ſpecifics for ſome diſeaſe or other, and the eaſy credulity of the people affords them a comfortable ſubſiſtence.

Were the Chineſe perpetual ſtrangers to every ſpecies of diſeaſe, it would enable us to account for their unnatural apathy or indifference about the ſtudy of phyſic; but it will remain an inexplicable paradox, when we are aſſured upon undoubted authority, that they are ſubject to a multiplicity of diſtempers. The ſmallpox, ophthalmia, contagious fevers, ſometimes the venereal, or Canton ulcer, as it is denominated by themſelves, are a few of the maladies incident to the Chineſe, which might conſtitute a powerful ſtimulus, one would imagine, to the ſtudy of phyſic, with unremitting aſſiduity, which it is certain they do not, as appears from the ſubſequent aſſertion of Dr Gregory. "In the greateſt, moſt ancient, and moſt civilized empire on the face of the earth, an empire that was great, populous, and highly civilized 2000 years ago, when this country was as ſavage as New Zealand is at preſent, no ſuch good medical aid can be obtained among the people of it, as a ſmart boy of 16, who had been but 12 months apprentice to a good and well employed Edinburgh ſurgeon, might reaſonably be expected to afford." This gives us a melancholy picture of the ſtate of medicine in China, which, however, is confirmed by the united teſtimony of Sir George Staunton and Mr Barrow.

The people of China are ſaid to be in the poſſeſſion of a method for aſcertaining whether a man has been murdered, or committed an act of ſuicide, of the probability of which our readers will be able to judge from the following proceſs. The body to be examined is waſhed with vinegar. A large fire is kindled in a pit dug for the purpoſe, ſix feet long, three wide, and the ſame in depth. The fire receives new acceſſion of fuel till the pit acquires the temperature of a heated oven, when the whole of the remaining fuel is taken out, and a large quantity of wine is poured into the pit. The body is then placed at full length on oſier twigs over the mouth of it, and covered with a cloth for two hours, that the ſteam of the wine may act upon the body in all directions. The Chineſe, it is ſaid, aſſert that if the blows given the body were ſo violent as to occaſion death, this proceſs makes the marks of them clearly appear, let the ſtate of the body, when ſubjected to this teſt, be ever ſo cadaverous.

133
Of their muſic.

With regard to the muſic of the Chineſe, we have the ſame ſtories related as of the Greeks and Egyptians, viz. that in former ages the muſicians could make brute animals leap at the ſound of their inſtruments. Our author, M. Groſier, indeed, does not quote any Chineſe author who aſſerts that the ancient muſic could make trees dance, or ſtones arrange themſelves into a city; but he quotes them, aſſerting, "that the muſicians could call down ſuperior ſpirits of every age from the ethereal regions; raiſe up the manes of departed beings; inſpire men with a love of virtue; and lead them to the practice of their duty." Effects of this ſupernatural kind are attributed to the ſacred muſic by the inſpired writers; as in the caſe of Saul, out of whom an evil ſpirit departed at the ſound of David's harp; and of Eliſha, who was inſpired with the ſpirit of prophecy at the ſound of a muſical inſtrument. It is probable, therefore, that the relations both of the Greeks and Chineſe are founded upon facts of this kind; and we cannot from thence infer, that the muſic of early ages was at all ſuperior to that which followed. According to thoſe who have employed much time in theſe reſearches, the ancient Chineſe were acquainted with the diviſion of the octave into twelve ſemitones; and that before the time of Pythagoras, or even Mercury himſelf: that the lyre of Pythagoras, his invention of the diatonic tetrachords, and the formation of his grand ſyſtem, were merely borrowed from the ancient Chineſe. In ſhort, it is maintained, that the Greeks, even Pythagoras himſelf, did nothing but apply to ſtrings that theory which the Chineſe had before formed, and applied to pipes.

At preſent the Chineſe are not acquainted with the uſe of our muſical notes; they have not that diverſity of ſigns which diſtinguiſh the different tones, and the gradual elevation or depreſſion of the voice, nor any thing to point out the various modifications of ſound to produce harmony. They have only a few characters to mark the principal notes; and all the airs they learn are repeated merely by rote. The emperor Kang-hi was therefore greatly aſtoniſhed at the facility with which an European could catch and remember an air the firſt time he heard it. In 1679 he ſent for Fathers Grimaldi and Pereira, to play ſome tunes on the harpſichord, of which they had before made him a preſent. He was greatly entertained with their muſic, but altogether aſtoniſhed when he found that F. Pereira could take down a Chineſe air while the muſicians were playing it, and then repeat the whole without omitting a ſingle note. Having made ſeveral trials of this kind in order to ſatisfy himſelf, he beſtowed the higheſt encomiums upon the European muſic, and the means furniſhed by it to facilitate and leſſen the labour of the memory. "I muſt confeſs (ſays he) that the European muſic is incomparable, and that the like of this F. Pereira is not to be found in my whole kingdom."

134
Muſical inſtruments.

The Chineſe have always diſtinguiſhed eight different ſounds; and they believe that nature, in order to produce theſe, formed eight different kinds of ſonorous bodies. The order in which they diſtribute theſe ſounds, and the inſtruments they have contrived to produce them, are, 1. The ſound of ſkin produced by drums; 2. That of ſtone produced by the *king*; 3. The ſound of metal by bells; 4. That of baked earth by the *huien*; 5. Of ſilk by the *kin* and *che*; 6. Of wood by the *yu* and *tchou*; 7. Of the bamboo by the *koan*, and different flutes; 8. That of a gourd by the *cheng*.

The drums were originally compoſed of a box made of baked earth, and covered at the extremities with the ſkin of ſome animal; but on account of the brittleneſs of baked earth, wood was ſoon ſubſtituted in its ſtead. Greater part of theſe inſtruments are ſhaped like our barrels, but ſome are cylindric.

The inſtruments formed of the ſonorous ſtones are called *king*, diſtinguiſhed into *tſe king* and *pien-king*. The *tſe-king* conſiſts only of one ſtone, and therefore produces only one note. The *pien-king* conſiſts of 16 ſtones ſuſpended together, and thus forming an inſtrument capable of producing all the tones admitted into the muſic of the ancient Chineſe. They are cut into the form of a carpenter's ſquare; their tone is flattened by diminiſhing their thickneſs, and is made ſharper by abridging their length.

Although in the eſtimation of the Chineſe, univerſal nature has been forced to contribute towards the perfection of their muſic, by furniſhing them with the ſkins of different animals, metals, ſtones, baked earths, and the fibrous parts of plants, Mr Barrow could diſcover no inſtrument among them of a muſical nature, the tones of which would have been even tolerable to a delicate European ear; and only one perſon in the courſe of his inveſtigations and reſearches could with any propriety be ſaid to ſing from tenderneſs and feeling. Yet without the ſmalleſt authority for ſuch a bold aſſertion, a certain Jeſuit has maintained, that the muſical ſyſtem of the Chineſe was borrowed from them by the Greeks and Egyptians before the time of Orpheus? He who can believe this extravagant aſſertion, after comparing the muſic of theſe countries together at any given period, will find it an eaſy matter to give credit to any thing whatever.

135
Bells of immenſe ſize.

The bells in China have always been made of a mixture of tin and copper. They are of different ſhapes, and thoſe of the ancients were not round but flatted, and in the lower part reſembling a creſcent. An inſtrument, correſponding to the king, already mentioned, is compoſed of 16 bells of different ſizes. Some of their bells uſed on public occaſions are of enormous magnitudes. One at Peking is deſcribed as 13½ feet in diameter, 12½ in height, and 42 in circumference; the weight being upwards of 120,000 pounds. It is uſed for announcing the hours or watches of the night; and its ſound, which is prodigiouſly loud and ſtrong, has a moſt awful effect in the night-time, by reverberating round the walls and the echo of the ſurrounding country. There are ſeveral others likewiſe of vaſt ſize in the ſame city; one of which deſerves greatly to be admired on account of the beautiful characters with which it is covered; and which are as neat and perfect as if traced out by the hand of the fineſt writer, or formed by means of a ſtamp upon wax. F. le Comte tells us, that in all the cities of China there are bells for marking the hours and watches of the night. They generally divide the night into five watches, beginning at ſeven or eight in the evening. On the commencement of the firſt they give one ſtroke, which is repeated a moment after; and thus they continue for two hours till the beginning of the ſecond: they then give two ſtrokes, which are repeated at equal intervals till the beginning of the third watch; and thus they proceed to the fourth and fifth, always increaſing the number of the ſtrokes. For the ſame purpoſe alſo they uſe enormous drums, which they beat in a ſimilar manner. F. Magaillans mentions one at Peking upwards of 40 feet in circumference.

The inſtrument called *huien*, which is made of baked earth, is highly eſteemed by the Chineſe on account of its antiquity. It is diſtinguiſhed into two kinds, the great and ſmall; the former being of the ſize of a gooſe's egg; the latter of that of a hen's. It has ſix holes for the notes, and a ſeventh for the mouth.

The *kin* and *tche* have been known from the remoteſt antiquity. The kin has ſeven ſtrings made of ſilk, and is diſtinguiſhed into three kinds, differing only in ſize. The body is formed of a kind of wood varniſhed black, and its whole length about five feet five inches. The *tche* is about nine feet in length, has 25 ſtrings, and is divided into 25 kinds. F. Amiot aſſures us, that we have no inſtrument in Europe which deſerves to be preferred to it.

The inſtruments which emit the ſound of wood are the *tchou*, the *yu*, and the *tchoung-ton*. The firſt is ſhaped like a buſhel, and is beat on the inſide with a hammer; the ſecond, which repreſents a tyger ſquatting, is made to ſound by ſcraping its back gently with a rod; the third is a collection of twelve pieces of boards tied together, which are uſed for beating time, by holding them in the right hand, and knocking them gently againſt the palm of the left.

Many inſtruments are conſtructed of the bamboo. Theſe conſiſt of pipes joined together, or ſeparate, and pierced with more or fewer holes. The principal of all theſe wind inſtruments is the *cheng*, which emits the ſound of a gourd. This is formed by cutting off the neck of a gourd, and reſerving only the lower part. To this a cover is fitted, having as many holes as are equal to the number of ſounds required. In each of theſe holes a pipe made of bamboo is fixed, and ſhorter or longer according to the tone intended. The mouth of the inſtrument is formed of another pipe ſhaped like the neck of a gooſe; which is fixed to the gourd on one ſide, and ſerves to convey the air to all the pipes it contains. The ancient *cheng* varied in the number of their pipes; thoſe uſed at preſent have only 13.

136
Chineſe painting.

The painting of the Chineſe is undoubtedly inferior to that of the Europeans, though we are not by any means to judge of the abilities of the painters of this empire by the performances which are brought to Europe. M. Groſier remarks, that the works of the eminent Chineſe painters are never brought to Canton, becauſe they cannot find purchaſers among the European merchants. The latter delight only in obſcene pictures, which are not permitted by government, nor indeed will any artiſt of character execute them, though they prevail upon ſome of the inferior daubers to gratify them in this reſpect. It ſeems, however, to be univerſally agreed, that the Chineſe have no notion of correctneſs or perſpective, and little knowledge of the proportions of the human body, though it cannot be denied that they excel in painting flowers and animals. In theſe they pride themſelves in a ſcrupulouſly exact imitation of nature, inſomuch that it is no uncommon thing to hear a painter aſk his pupil how many ſcales there are between the head and tail of a carp.

Painting was formerly much eſteemed in China, but has now fallen into diſrepute on account of its political inutility. The cabinets and galleries of the emperor, however, are filled with European paintings, and the celebrated artiſts Caſtiglioni and Attiret were both employed; but their offer of erecting a ſchool of painting was rejected, leſt they ſhould by this means revive the taſte for that art which it had been formerly thought prudent to ſuppreſs.

Painting in freſco was known in China long before the Chriſtian era; and, like the Grecians, the Chineſe boaſt much of their celebrated painters of antiquity. Thus we are told of a door painted by Fan-hien, which was ſo perfect an imitation, that the people who entered the temple where it was, attempted to go out by it, unleſs prevented by thoſe who had ſeen it before. The preſent emperor has in his park an European village painted in freſco, which produces the moſt agreeable deception. The remaining part of the wall repreſents a landſcape and little hills, which are ſo happily blended with the diſtant mountains, that nothing can be conceived more agreeable. This was the production of Chineſe painters, and executed from deſigns ſketched out for them.

After this account of the ſtate of painting in China, chiefly on the authority of M. Groſier, we beg leave to remark, upon the authority of more recent, and ſeemingly more competent as well as more inquiſitive obſervers, that painting in China is at a low ebb, which made a certain artiſt once exclaim, "Theſe Chineſe are fit for nothing but weighing ſilver, and eating rice." They can copy with tolerable exactneſs what is laid before them, but ſo deficient are they in reſpect to a judicious alternation of light and ſhade; and therefore without diſcovering a ſingle ſymptom of taſte, beauties, and defects are alike ſlaviſhly imitated. Their ſuppoſed excellence in drawing flowers, birds, and inſects to the life, is moſt remarkable in the city of Canton; from which Mr Barrow conjectures that they acquire their eminence by copying the productions of Europe, occaſionally ſent over to be transferred to the porcelain deſigned for exportation.

137
Engraving.

Engraving in three, four, or five colours, is very ancient among the Chineſe, and was known in this empire long before its diſcovery in Europe.

138
Sculpture.

Sculpture is very little known in this empire; nor is there a ſingle ſtatue in any of the ſquares or public edifices of Peking, not even in the emperor's palace. The only real ſtatues to be met with in the empire are thoſe which, for the ſake of ceremonious diſtinction, are uſed to ornament the avenues leading to the tombs of princes and men of great rank; or thoſe that are placed near the emperor's coffin, and that of his ſons and daughters in the interior part of the vault, where their remains are depoſited.

139
Architecture.

The Chineſe architecture is entirely different from that of the Greeks or Romans; but nevertheleſs has certain proportions of its own, and a beauty peculiar to itſelf. The habitations of the emperor are real palaces, and announce in a ſtriking manner the majeſty and grandeur of the maſter who inhabits them. All the miſſionaries who had acceſs to the inſide of the emperor's palace at Peking, agreed, that if each of its parts, taken ſeparately, does not afford ſo much delight to the eye as ſome pieces of the grand architecture of Europe, the whole preſents a ſight ſuperior to any thing they had ever ſeen before. In the Chineſe architecture, when a pillar is two feet in diameter at the baſe, its height muſt be 14 feet; and by meaſures of this kind the height of every building is determined.

Almoſt all the houſes and buildings in China are conſtructed of wood. One reaſon of this may be the dread of earthquakes; but, beſides this, ſuch buildings are rendered eligible by the heat and dampneſs of the ſouthern provinces, and the exceſſive cold in the northern, which would render ſtone-houſes almoſt uninhabitable. Even at Peking, where the rains are but of ſhort duration, it is found neceſſary to cover the ſmall marble ſtaircaſes belonging to the imperial palace with pieces of felt; the humidity of the air moiſtens and ſoaks into every thing. During winter the cold is ſo exceſſively ſevere, that no window can be opened to the north; and water continues conſtantly frozen to the depth of a foot and a half for more than three months. For the ſame reaſons a variety of ſtories are not uſed in the Chineſe buildings; as neither a ſecond nor third ſtory would be habitable during the great heats of ſummer or the rigorous cold of winter. Though Peking is ſituated in the northern part of the empire, the heat there, during the dog-days, is ſo intolerably ſcorching, that the police obliges tradeſmen and ſhopkeepers to ſleep in the open air in the piazzas of their houſes, leſt they ſhould be ſtifled by retiring into their inner apartments. The habitations of people of rank, or of thoſe in eaſy circumſtances, generally conſiſt of five large courts, incloſed with buildings on every ſide. The method of building with ſeveral ſtories was, however, followed for ſeveral centuries, when the court reſided in the ſouthern provinces; and the taſte for this kind of building was carried to ſuch a height, that immenſe edifices were erected from 150 to 200 feet in height, and the pavilions or towers at the extremities roſe upwards of 300 feet. This kind of building, however, at length became diſguſting; though either to preſerve the remembrance of it, or for the ſake of variety, there are ſtill ſome buildings to be ſeen ſeveral ſtories high in the palaces belonging to the emperor.

140 Bridges. A multiplicity of bridges are rendered neceſſary in China by the vaſt number of canals and rivers which interſect the empire. Anciently, however, the Chineſe bridges were much more ingenious as well as magnificent than they are at preſent. Some of them were ſo contrived that they could be erected in one day to ſupply the place of others which might happen to be broken down, or for other purpoſes. At that time they had bridges which derived their name from their figure; as *reſembling the rainbow; draw-bridges, bridges to move with pulleys, compaſs-bridges,* &c. with many others entirely unknown at preſent. The building of bridges indeed was once a luxurious folly of the emperors; ſo that they were multiplied from whim or caprice, without any neceſſity, and without uſe. Still, however, many of them are extremely beautiful and magnificent. The arches of ſome are very lofty and acute, with eaſy ſtairs on each ſide, the ſteps of which are not quite three inches in thickneſs, for the greater facility of aſcending and deſcending: others have no arches, but are compoſed of large ſtones, ſometimes 18 feet in length, placed tranſverſely upon piles like planks. Some of theſe bridges are conſtructed of ſtone, marble, or brick; others of wood; and ſome are formed of a certain number of barks joined together by very ſtrong iron chains. Theſe are known by the name of floating bridges, and ſeveral of them are to be ſeen on the large rivers Kiang and Hoang-ho.

141 Ship-building. For ſeveral centuries the Chineſe have made no progreſs in ſhip-building. Their veſſels have neither mizen, bowſprit, nor top-maſt. They have only a main and fore-maſt, to which is ſometimes added a ſmall top-gallant-maſt. The main-maſt is placed almoſt in the ſame part of the deck as ours; but the fore-maſt ſtands much farther forward. The latter is to the former in the proportion of two to three; and the main-maſt is generally two-thirds of the length of the veſſel. They uſe mats for ſails, ſtrengthening them with whole bamboos equal in length to the breadth of the ſail, and extended acroſs it at the diſtance of a foot from one another. Two pieces of wood are fixed to the top and bottom of the ſail; the upper ſerves as a ſail-yard; and the lower, which is about five or ſix inches in thickneſs, keeps the ſail ſtretched when it is neceſſary to hoiſt or lower it. This kind of ſail may be folded or unfolded like a ſcreen. For caulking their veſſels they do not uſe pitch, but a particular kind of gum mixed with lime, which forms a compoſition of ſuch excellent quality, that one or two wells in the hold are ſufficient to keep the veſſel dry. They have not yet adopted the uſe of pumps, and therefore draw up the water with buckets. Their anchors are made of the hard wood called *iron wood*, which they ſay is much ſuperior to the metal, becauſe the latter ſometimes bend, but the former never do.

The Chineſe pretend to have been the firſt inventors of the mariner's compaſs, but ſeem to have little inclination to improve ſuch an important inſtrument: however, they are well acquainted with the art of manœuvring a veſſel, and make excellent coaſting pilots, though they are bad ſailors in an open ſea.

China-Root, in the *Materia Medica*, the root of a ſpecies of SMILAX, brought both from the Eaſt and Weſt Indies: and thence diſtinguiſhed into oriental and occidental. Both ſorts are longiſh, full of joints, of a pale-reddiſh colour, with no ſmell, and very little taſte. The oriental, which is the moſt eſteemed, is conſiderably harder, and paler-coloured than the other. Such ſhould be choſen as is freſh, cloſe, heavy, and upon being chewed appears full of a fat unctuous juice. It is generally ſuppoſed to promote inſenſible perſpiration and the urinary diſcharge, and by its unctuous quality to obtund acrimonious juices. China-root was firſt brought into Europe in the year 1535, and uſed as a ſpecific againſt venereal and cutaneous diſorders. With this view it was made uſe of for ſome time; but has long ſince given place to more powerful medicines.

China Ware. See Porcelain.

CHINCA, a ſea port town in Peru in South America, ſituated in an extenſive valley of the ſame name, in W. Long. 76. 0. S. Lat. 13. 0.

CHINCOUGH, a convulſive kind of cough to which children are generally ſubject. See Medicine *Index*.

CHINESE, in general denotes any thing belonging to China or its inhabitants.

Chinese Swanpan. See Abacus.

CHINKAPIN. See Fagus, Botany *Index*.

CHINNOR, a muſical inſtrument among the Hebrews, conſiſting of 32 chords. Kircher has given a figure of it, which is copied on Plate CXLV.

CHINON, an ancient town of Tourain in France, remarkable for the death of Henry II. king of England, and for the birth of the famous Rabelais. It is ſeated on the river Vienne, in a pleaſant and fertile country, in E. Long. 0. 18. N. Lat. 47. 2.

CHIO, or Chios, an Aſiatic iſland lying near the coaſt of Natolia, oppoſite to the peninſula of Ionia. It was known to the ancients by the name of Ethalia, Macris, Pithyuſa, &c. as well as that of Chios. According to Herodotus, the iſland of Chios was peopled originally from Ionia. It was at firſt governed by kings: but afterwards the government aſſumed a republican form, which by the direction of Iſocrates was modelled after that of Athens. They were, however, ſoon enſlaved by tyrants, and afterwards conquered by Cyrus king of Perſia. They joined the other Grecians in the Ionian revolt; but were ſhamefully abandoned by the Samians, Leſbians, and others of their allies; ſo that they were again reduced under the yoke of the Perſians, who treated them with the utmoſt ſeverity. They continued ſubject to them till the battle of Mycale, when they were reſtored to their ancient liberty: this they enjoyed till the downfal of the Perſian empire, when they became ſubject to the Macedonian princes. In the time of the emperor Veſpaſian the iſland was reduced to the form of a Roman province; but the inhabitants were allowed to live according to their own laws under the ſuperintendence of a prætor. It is now ſubject to the Turks, and is called *Scio*. See that article.

CHIOCOCCA. See Botany *Index*.

CHIONANTHUS, the Snow-drop or Fringe-tree. See Botany *Index*.

CHIONE, in fabulous hiſtory, was daughter of Dædalion, of whom Apollo and Mercury became enamoured. To enjoy her company, Mercury lulled her to ſleep with his caduceus; and Apollo, in the night, under the form of an old woman, obtained the ſame favours as Mercury. From this embrace Chione became mother of Philammon and Autolycus; the former of whom, as being ſon of Apollo, became an excellent muſician; and the latter was equally notorious for his robberies, of which his father Mercury was the patron. Chione grew ſo proud of her commerce with the gods, that ſhe even preferred her beauty to that of Juno; for which impiety ſhe was killed by the goddeſs and changed into a hawk.—Another of the ſame name was daughter of Boreas and Orithia, who had Eumolpus by Neptune. She threw her ſon into the ſea; but he was preſerved by his father.

CHIOS. See Chio and Scio.

CHIOURLIC, an ancient town of Turkey in Europe, and in Romania, with a ſee of a Greek biſhop. It is ſeated on a river of the ſame name, in E. Long. 7. 47. N. Lat. 41. 18.

CHIOZZO, an ancient and handſome town of Italy, in the territory of Venice, and in a ſmall iſland, near the Lagunes, with a podeſta, a biſhop's ſee, and a harbour defended by a fort. E. Long. 12. 23. N. Lat. 45. 17.

CHIPPENHAM, a town of Wiltſhire, ſeated on the river Avon. It is a good thoroughfare town; has a handſome ſtone bridge over the river, conſiſting of 16 arches; and ſends two members to parliament. There is here a manufacture of the beſt ſuperfine woollen cloth in England. W. Long. 2. 12. N. Lat. 51. 25.

CHIPPING, a phraſe uſed by the potters and china-men to expreſs that common accident both of our own ſtone and earthen ware, and the porcelain of China, the flying off of ſmall pieces, or breaking at the edges. Our earthen wares are particularly ſubject to this, and are always ſpoiled by it before any other flaw appears in them. Our ſtone wares eſcape it better than theſe; but not ſo well as the porcelain of China, which is leſs ſubject to it than any other manufacture in the world. The method by which the Chineſe defend their ware from this accident, is this: They carefully burn ſome ſmall bamboo canes to a ſort of charcoal, which is very light, and very black; this they reduce to a fine powder, and then mix it into a thin paſte, with ſome of the varniſh which they uſe for their ware: they next take the veſſels when dried, and not yet baked, to the wheel; and turning them ſoftly round, they, with a pencil dipt in this paſte, cover the whole circumference with a thin coat of it: after this, the veſſel is again dried; and the border made with this paſte appears of a pale greyiſh colour when it is thoroughly dry. They work on it afterwards in the common way, covering both this edge and the reſt of the veſſel with the common varniſh. When the whole is baked on, the colour given by the aſhes diſappears, and the edges are as white as any other part; only when the baking has not been ſufficient, or the edges have not been covered with the ſecond varniſhing, we ſometimes find a duſky edge, as in ſome of the ordinary thick tea-cups. It may be a great advantage to our Engliſh manufacturers to attempt ſomething of this kind. The willow is known to make a very light and black charcoal: but the elder, though a thing ſeldom uſed, greatly exceeds it. The young green ſhoots of this ſhrub, which are almoſt all pith, make the lighteſt and the blackeſt of all charcoal; this readily mixes with any liquid, and might be eaſily uſed in the ſame way that the Chineſe uſe the charcoal of the bamboo cane, which is a light hollow vegetable, more reſembling the elder ſhoots than any other Engliſh plant. It is no wonder that the fixed ſalt and oil contained in this charcoal ſhould be able to penetrate the yet raw edges of the ware, and to give them in the ſubſequent baking a ſomewhat different degree of vitrification from the other parts of the veſſel; which, though, if given to the whole, it might take off from the true ſemivitrified ſtate of that ware, yet at the edges is not to be regarded, and only ſerves to defend them from common accidents, and keep them entire. The Chineſe uſe two cautions in this application: the firſt in the preparation; the ſecond in the laying it on. They prepare the bamboo canes for burning into charcoal, by peeling off the rind. This might eaſily be done with our elder ſhoots, which are ſo ſucculent, that the bark ſtrips off with a touch. The Chineſe ſay, that if this is not done with their bamboo, the edges touched with the paſte will burſt in the baking: this does not ſeem indeed very probable; but the charcoal will certainly be lighter made from the peeled ſticks, and this is a known advantage. The other caution is, never to touch the veſſel with hands that have any greaſy or fatty ſubſtance about them; for if this is done, they always find the veſſel crack in that place.

CHIROGRAPH, was anciently a deed which, requiring a counterpart, was engroſſed twice on the ſame piece of parchment, counterwiſe; leaving a ſpace between, wherein was written Chirograph; through the middle whereof the parchment was cut, ſometimes ſtraight, ſometimes indentedly; and a moiety given to each of the parties. This was afterwards called *dividenda*, and *chartæ diviſæ*; and was the ſame with what we now call *charter-party*. See *Charter-Party*. The firſt uſe of theſe chirographs, with us, was in the time of Henry III.

Chirograph was alſo anciently uſed for a fine; and the manner of engroſſing the fines, and cutting the parchment in two pieces, is ſtill retained in the office called the *chirographer's office*.

CHIROGRAPHER *of* Fines, an officer in the common pleas, who engroſſes fines acknowledged in that court into a perpetual record (after they have been examined, and paſſed by other officers), and writes and delivers the indentures thereof to the party. He makes two indentures; one for the buyer, the other for the ſeller; and a third indented piece, containing the effect of the fine, and called *the foot of the fine*: and delivers it to the *cuſtos brevium*.—The ſame officer alſo, or his deputy, proclaims all fines in court every term, and indorſes the proclamations on the backſide of the foot; keeping, withal, the writ of covenant, and the writ of fine.

CHIROMANCY, a ſpecies of divination drawn from the lines and lineaments of a perſon's hand, by which means, it is pretended, the diſpoſitions may be diſcovered. See Divination, N° 9.

CHIRON, a famous perſonage of antiquity; ſtyled by Plutarch, in his dialogue on muſic, "*The wiſe Centaur.*" Sir Iſaac Newton places his birth in the firſt age after Deucalion's deluge, commonly called the *Golden Age*; and adds, that he formed the conſtellations for the uſe of the Argonauts, when he was 88 years old; for he was a practical aſtronomer, as well as his daughter Hippo: he may, therefore, be ſaid to have flouriſhed in the earlieſt ages of Greece, as he preceded the conqueſt of the Golden Fleece, and the Trojan war. He is generally called the ſon of Saturn and Phillyra; and is ſaid to have been born in Theſſaly among the Centaurs, who were the firſt Greeks that had acquired the art of breaking and riding horſes: whence the poets, painters, and ſculptors, have repreſented them as a compound of man and horſe; and perhaps it was at firſt imagined by the Greeks, as well as the Americans, when they firſt ſaw cavalry, that the horſe and the rider conſtituted the ſame animal.

Burney's Hiſt. of Muſic.

Chiron was repreſented by the ancients as one of the firſt inventors of medicine, botany, and *chirurgery*; a word which ſome etymologiſts have derived from his name. He inhabited a grotto or cave in the foot of Mount Pelion, which, from his wiſdom and great knowledge of all kinds, became the moſt famous and frequented ſchool throughout Greece. Almoſt all the heroes of his time were fond of receiving his inſtructions; and Xenophon, who enumerates them, names the following illuſtrious perſonages among his diſciples: Cephalus, Æſculapius, Melanion, Neſtor, Amphiaraus, Peleus, Telamon, Meleager, Theſeus, Hippolitus, Palamedes, Ulyſſes, Mneſtheus, Diomedes, Caſtor and Pollux, Machaon and Podalirius, Antilochus, Æneas, and Achilles. From this catalogue it appears, that Chiron frequently inſtructed both fathers and ſons; and Xenophon has given a ſhort eulogium on each, which may be read in his works, and which redounds to the honour of the preceptor. The Greek hiſtorian, however, has omitted naming ſeveral of his ſcholars, ſuch as Bacchus, Phœnix, Cocytus, Aryſtæus, Jaſon, and his ſon Medeus, Ajax, and Proteſilaus. Of theſe we ſhall only take notice of ſuch as intereſt Chiron more particularly. It is pretended that the Grecian Bacchus was the favourite ſcholar of the Centaur; and that he learned of this maſter the revels, orgies, bacchanalia, and other ceremonies of his worſhip. According to Plutarch, it was likewiſe at the ſchool of Chiron that Hercules ſtudied muſic, medicine, and juſtice; though Diodorus Siculus tells us, that Linus was the muſic-maſter of this hero. But among all the heroes who have been diſciples of this Centaur, no one reflected ſo much honour upon him as Achilles, whoſe renown he in ſome meaſure ſhared; and to whoſe education he in a particular manner attended, being his grandfather by the mother's ſide. Apollodorus tells us, that the ſtudy of muſic employed a conſiderable part of the time which he beſtowed upon his young pupil, as an incitement to virtuous actions, and a bridle to the impetuoſity of his temper. One of the beſt remains of antique painting now exiſting, is a picture upon this ſubject, dug out of the ruins of Herculaneum, in which Chiron is teaching the young Achilles to play on the lyre. The death of this philoſophic muſician was occaſioned, at an extreme old age, by an accidental wound in the knee with a poiſoned arrow, ſhot by his ſcholar Hercules at another. He was placed after his death by Muſæus among the conſtellations, through reſpect for his virtues, and in gratitude for the great ſervices which he had rendered the people of Greece. Sir Iſaac Newton ſays[*], in proof of the conſtellations being formed by Chiron and Muſæus for the uſe and honour of the Argonauts, that nothing later than the expedition was delineated on the ſphere: according to the ſame author, Chiron lived till after the Argonautic expedition, in which he had two grandſons. The ancients have not failed to attribute to him ſeveral writings; among which, according to Suidas, are *precepts*, ὑποθήκας, in verſe, compoſed for the uſe of Achilles; and a medicinal treatiſe on the *diſeaſes incident to horſes* and other quadrupeds, ιππιατριχον; the lexicographer even pretends, that it is from this work the Centaur derived his name. Fabricius gives a liſt of the works attributed to Chiron, and diſcuſſes the claims which have been made for others to the ſame writings: and in vol. xiii. he gives him a diſtinguiſhed place in his catalogue of ancient phyſicians.

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[*] *Chronol.* p. 151.

CHIRONIA. See Botany *Index*.

CHIRONOMY, in antiquity, the art of repreſenting any paſt tranſaction by the geſtures of the body, more eſpecially by the motions of the hands: this made a part of liberal education; it had the approbation of Socrates, and was ranked by Plato among the political virtues.

CHIROTONY, among eccleſiaſtical writers, denotes the impoſition of hands uſed in conferring prieſtly orders. However, it is proper to remark, that chirotony originally was a method of electing magiſtrates, by holding up the hands.

CHIRURGEON, or Surgeon. See Surgeon.

CHIRURGERY. See Surgery.

CHISLEY-land, in *Agriculture*, a ſoil of a middle nature between ſandy and clayey land, with a large admixture of pebbles.

CHISON, Kison, or Kisson, (Judges iv. and v.) a river of Galilee; ſaid to riſe in Mount Tabor, to run by the town of Naim, and to fall into the Mediterranean between Mount Carmel and Ptolemais, (1 Kings xviii. 40.)

CHISSEL, or Chisel, an inſtrument much uſed in ſculpture, maſonry, joinery, carpentry, &c.

There are chiſſels of different kinds; though their chief difference lies in their different ſize and ſtrength, as being all made of ſteel well ſharpened and tempered: but they have different names, according to the different uſes to which they are applied. The chiſſels uſed in carpentry and joinery are, 1. The former; which is uſed firſt of all before the parting chiſſel, and juſt after the work is ſcribed. 2. The paring chiſſel; which has a fine ſmooth edge, and is uſed to pare off or ſmooth the irregularities which the former makes. This is not ſtruck with a mallet as the former is, but is preſſed with the ſhoulder of the workman. 3. Skew-former: this is uſed for cleanſing acute angles with the point or corner of its narrow edge. 4. The mortiſe-chiſſel; which is narrow, but very thick and ſtrong, to endure hard blows, and it is cut to a very broad baſil. Its uſe is to cut deep ſquare holes in the wood for mortiſes. 5. The gouge, which is a chiſſel with a round edge; one ſide whereof ſerves to prepare the way for an augre, and the other to cut ſuch wood as is to be rounded, hollowed, &c. 6. Socket-chiſſels, which are chiefly uſed by carpenters, &c. have their ſhank made with a hollow ſocket at top; to receive a ſtrong wooden ſprig, fitted into it with a ſhoulder. Theſe chiſſels are diſtinguiſhed, according to the breadth of the blade, into half-inch chiſſels, three quarters of an inch chiſſels, &c. 7. Ripping chiſſels; which is a ſocket-chiſſel of an inch broad, having a blunt edge, with no baſil to it. Its uſe is to rip or tear two pieces of wood aſunder, by forcing in the blunt edge between them.

CHITON, in *Zoology*, a genus of the order of vermes teſtaceæ. The name *chiton* is from χιτων, *lorica*, a coat of mail. The ſhell is plated, and conſiſts of many parts lying upon each other tranſverſely: the inhabitant is a ſpecies of the Doris. See Conchology *Index*.

CHITTIM, in *Ancient Geography*, according to Le Clerc, Calmet, and others, was the ſame with Macedonia, peopled by Kittim the ſon of Javan and grandſon of Noah.

CHITTRICK's medicine for the stone. This medicine was ſome years ago kept as a ſecret, and had great reputation as a lithontriptic, which indeed it ſeems in many caſes to deſerve. It was diſcovered by Dr Blackrie to be no other than ſoap-lye; and the following receipt for uſing it was procured by General Dunbar: "Take one tea-ſpoonful of the ſtrongeſt ſoap-lye, mixed in two table-ſpoonfuls of ſweet milk, an hour before breakfaſt, and at going to bed. Before you take the medicine, take a ſup of pure milk, and immediately after you have ſwallowed the medicine take another. If you find this agrees with you for two or three days, you may add half as much more to the doſe."

1
Definition.

CHIVALRY, (from *cheval*, "a horſe"); an abſtract term, uſed to expreſs the peculiar privileges, obligations, and turn of mind, with all the other diſtinguiſhing characteriſties of that order of men who flouriſhed in Europe in the dark ages, during the vigour of the feudal ſyſtems of government, under the name of *Knights* or *Knights Errant*.

2
Difficulty of tracing the origin of chivalry.

To aſcertain the period at which the order ſprung up, and the circumſtances to which its origin was owing, is no eaſy taſk. In the hiſtory of ſociety, ſuch a multiplicity of collateral facts appear interwoven together, and cauſes and effects run into each other by a gradation ſo imperceptible, that it is exceedingly difficult, even for the niceſt eye, to diſcern cauſes from their immediate effects, or to diſtinguiſh to which among a number of collateral circumſtances the origin of any particular event is to be referred. The age to which we muſt look for the origin of chivalry was ſingularly rude and illiterate. Even the principal events of that period, emigrations, wars, and the eſtabliſhment of ſyſtems of laws and forms of government, have been but imperfectly, and in many inſtances unfaithfully, recorded. But the tranſactions which took place in the ordinary courſe of civil and domeſtic life, and which, though leſs ſtriking, muſt have always prepared the way for the more remarkable events, have been generally thought unworthy of tranſmiſſion to poſterity, and have very ſeldom found a hiſtorian. Add to theſe difficulties which oppoſe our reſearches on this ſubject, that the nations of Europe were in that age a mixed multitude, conſiſting of the aboriginal inhabitants, who, though either ſubdued by the Roman arms, or at leaſt compelled to retire to the woods and mountains, ſtill obſtinately retained their primitive manners and cuſtoms; Roman colonies, and ſuch of the original inhabitants of the countries in which theſe were eſtabliſhed, as had yielded not only to the arms of the Romans, but alſo to the influence of their laws, arts, and manners; and the barbarians, who proceeding from the northern regions of Aſia and Europe, the wilds of Scythia and Germany, diſſolved the fabric of the Roman empire, and made themſelves lords of Europe. Amid this confuſion of nations, inſtitutions, and cuſtoms, it becomes almoſt impoſſible to trace any regular ſeries of cauſes and effects.

Yet as the hiſtory of that period is not entirely unknown to us, and the obſcure and imperfect records in which it is preſerved, while they commemorate the more remarkable events, throw a faint light on the cuſtoms, manners, and ordinary tranſactions of the age; we can at leaſt collect ſome circumſtances, which, if they did not of themſelves give riſe to the inſtitution of chivalry, muſt certainly have co-operated with others to that end. We may even be allowed, if we proceed with due diffidence and caution, to deduce, from a conſideration of the effect, ſome inferences concerning the cauſe; from thoſe particulars of its hiſtory which are known to us, we may venture to carry imagination backwards, under a proper reſtraint, to thoſe which are hid under the darkneſs of a rude and illiterate age.

3
iſtinction f ranks an ſential art of the echaniſm f ſociety.

Diſtinction of ranks appears to be eſſentially neceſſary to the exiſtence of civil order. Even in the ſimpleſt and rudeſt ſocial eſtabliſhments, we find not merely the natural diſtinctions of weak and ſtrong, young and old, parent and child, huſband and wife; theſe are always accompanied with others which owe their inſtitution to the invention of man, and the conſent, either tacit or formal, of the ſociety among whom they prevail. In peace and in war, ſuch diſtinctions are equally neceſſary: they conſtitute an eſſential and important part of the mechaniſm of ſociety.

4
he early re-emi- ence of e milita- charac- r.

One of the earlieſt artificial diſtinctions introduced among mankind, is that which ſeparates the bold and ſkilful warrior from thoſe whoſe feebleneſs of body and mind renders them unable to excel in dexterity, ſtratagem, or valour. Among rude nations, who are but imperfectly acquainted with the advantages of ſocial order, this diſtinction is more remarkably eminent than in any other ſtate of ſociety. The ferocity of the human character in ſuch a period produces almoſt continual hoſtilities among neighbouring tribes; the elements of nature, and the brute inhabitants of the foreſt, are not yet reduced to be ſubſervient to the will of man; and theſe, with other concomitant circumſtances, render the warrior, who is equally diſtinguiſhed by cunning and valour, more uſeful and reſpectable than any other character.

5
ubordi- ate diſ- nctions f rank in- roduced to ſo- iety.

On the ſame principles, as the boundaries of ſociety are enlarged, and its form becomes more complex, the claſſes into which it is already diſtinguiſhed are again ſubdivided. The invention of arts, and the acquiſition of property, are the chief cauſes of theſe new diſtinctions which now ariſe among the orders of ſociety; and they extend their influence equally through the whole ſyſtem. Difference of armour, and different modes of military diſcipline, produce diſtinction of orders among thoſe who practiſe the arts of war; while other circumſtances, originating from the ſame general cauſes, occaſion ſimilar changes to take place amidſt the ſcenes of peace.

6
he diſ- nction in- oduced to the ilitary rder by e uſe of avalry.

None of the new diſtinctions which are introduced among men, with reſpect to the diſcipline and conduct of war, in conſequence of the acquiſition of property and the invention of arts, is more remarkable than that occaſioned by the uſe of horſes in military expeditions, and the training of them to the evolutions of the military art. Fire-arms, it is true, give to thoſe who are acquainted with them a greater ſuperiority over thoſe to whom their uſe is unknown, than what the horſeman poſſeſſes over him who fights on foot. But the uſe of fire-arms is of ſuch importance in war, and the expence attending it ſo inconſiderable, that wherever theſe have been introduced, they have ſeldom been confined to one particular order in an army; and, therefore, they produce indeed a remarkable, though tranſient, diſtinction among different nations, but eſtabliſh no permanent diſtinctions in the armies in any one nation. But to maintain a horſe, to equip him with coſtly furniture, to manage him with dexterity and vigour, are circumſtances which have invariably produced a ſtanding and conſpicuous diſtinction among the military order, wherever bodies of cavalry have been formed. The Roman *equites*, who, though they became at length a body of uſurers and farmers-general, were originally the only body of cavalry employed by the ſtate, occupied a reſpectable rank between the ſenators and the plebeians; and the elegance and humanity of their manners were ſuitable to their rank. In ancient Greece, and in the celebrated monarchies of Aſia, the ſame diſtinction prevailed at a ſimilar period.

7
Military diſtinctions among the ancient Germans.

Since the circumſtances and principles on which this diſtinction depends are not ſuch as muſt be confined in their influence to one particular nation, or one region of the globe, we may hope to trace their effects among the ſavage warriors of Scythia and Germany, as well as among the Greeks or Romans. From the valuable treatiſe of Tacitus *de Moribus Germanorum*, we learn that, among the German warriors a diſtinction ſomewhat of this nature *did* actually ſubſiſt; not ſo much indeed a diſtinction between the warrior who fought on horſeback and thoſe who fought on foot, as between thoſe whom vigour of body and energy of mind enabled to brave all the dangers of war, and ſuch as, from the imbecility of youth, the infirmities of age, or the natural inferiority of their mental and bodily powers, were unequal to ſcenes of hardſhip and deeds of valour. The youth was not permitted to take arms and join his warlike countrymen in their military expeditions whenever he himſelf thought proper: there was a certain age before which he could not be inveſted with armour. When he had attained that period, if not found deficient in ſtrength, activity, or courage, he was formally honoured with the ſhield and the lance, called to the duties, and admitted to all the privileges of a warrior.

8
Reſpectability of the women among the Germans.

Another fact worthy of notice, reſpecting the manners of the barbarians of Germany before they eſtabliſhed themſelves in the cultivated provinces of the Roman empire, is, that their women, contrary to what we find among many other rude nations, were treated with a high degree of reſpect. They did not generally vie with the men in deeds of valour, but they animated them by their exhortations to diſtinguiſh themſelves in the field; and virgins eſpecially were conſidered with a ſacred veneration, as endowed with prophetic powers, capable of foreſeeing events hid in the womb of futurity, and even of influencing the will of the deities. Hence, though domeſtic duties were their peculiar province, yet they were not harſhly treated nor confined to a ſtate of ſlavery. There appears indeed a ſtriking analogy between the condition of the women among the rude ſoldiers of Sparta and the rank which they occupied among the warlike cantons of Germany. Perhaps, indeed, the German were ſtill more honourable than the Spartan women; as they were taught to wield the magic weapons of ſuperſtition, which in Greece were appropriated to the prieſts.

It appears, therefore, that, in the foreſts of Germany at leaſt, if not the more northern regions of Aſia and Europe, the conquerors of the Roman empire, before they penetrated into its provinces, treated their women with a degree of reſpect unknown to moſt of the nations of antiquity; that the character of the warrior was likewiſe highly honourable, being underſtood to unite all thoſe qualities which were in the higheſt eſtimation; and that it was only at a particular age, and with certain forms, that the youth were admitted to bear arms.

9 Changes in the manners of the barbarians after they ſettled in the Roman empire, which gave riſe to chivalry.

When thoſe nations ſallied from their deſerts and foreſts, overran the Roman empire, and eſtabliſhed themſelves in its provinces, the changes which took place in their circumſtances were remarkable; and by a natural influence, it could not but produce an equally remarkable change on their habits, cuſtoms, and manners. The great outlines might ſtill remain: but they could not now fail to be filled up in a different manner. Here, however, the records of hiſtory are peculiarly imperfect. We have no Cæſar or Tacitus to ſupply facts or direct our reaſonings; the Gothic nations had not yet learned to read and write; and the Romans were ſo depreſſed under the ſenſe of their own miſeries, as to be negligent of the changes which happened around them. But as ſoon as the light of hiſtory begins again to dawn, we find that the leading features of the barbarian character were not effaced, but only modified in a particular manner, in conſequence of their mixing among a more poliſhed people, becoming acquainted with the luxuries of life, and acquiring extenſive power and property.

Thoſe who fought on horſeback now began to be diſtinguiſhed with peculiar honours. The manners of the warrior too were become more cultivated, and his ſpirit more humane. Leiſure and opulence, with the influence of a poliſhed people, even though in a ſtate of ſlavery, taught thoſe barbarians to aſpire after more refined pleaſures and more ſplendid amuſements than thoſe with which they had been before ſatisfied. The influence of Chriſtianity, too, which, though groſsly corrupted, was ſtill favourable to the ſocial happineſs of mankind, concurred to poliſh their manners and exalt their character. Hence, in the end of the tenth and in the beginning of the eleventh century, we ſee knight-errantry, with that romantic gallantry, piety, and humanity, by which it was principally diſtinguiſhed, make its appearance. At the court of every prince, count, or baron, jouſts and tournaments became the favourite amuſements. At thoſe entertainments, ſkill in arms, devotion to the fair, and generous courteſy, were all at once cultivated. About this period began the cruſades; and theſe, to which alone ſome have referred the origin of chivalry, though they could not give riſe to what was already in exiſtence, yet moulded the form and directed the ſpirit of the inſtitution in ſuch a manner, as to raiſe it, by a rapid progreſs from infancy, as it were, to full vigour and maturity. Its character, as it appeared when fully formed, is well deſcribed by an eloquent hiſtorian in the following manner:

Gibbon, vol. vi. p. 26.

"Between the age of Charlemagne and that of the cruſades, a revolution had taken place among the Spaniards, the Normans, and the French, which was gradually extended to the reſt of Europe. The ſervice of the infantry was degraded to the plebeians; the cavalry formed the ſtrength of the armies, and the honourable name of *miles*, or ſoldier, was confined to the gentlemen who ſerved on horſeback, and were inveſted with the character of knighthood. The dukes and counts, who had uſurped the rights of ſovereignty, divided the provinces among their faithful barons: the barons diſtributed among their vaſſals the fiefs or benefices of their juriſdiction; and theſe military tenants, the peers of each other and of their lord, compoſed the noble or equeſtrian order, which diſdained to conceive the peaſant or burgher as of the ſame ſpecies with themſelves. The dignity of their birth was preſerved by pure and equal alliances; their ſons alone who could produce four quarters or lines of anceſtry, without ſpot or reproach, might legally pretend to the honour of knighthood; but a valiant plebeian was ſometimes enriched and ennobled by the ſword, and became the father of a new race. A ſingle knight could impart, according to his judgment, the character which he received; and the warlike ſovereigns of Europe derived more glory from this perſonal diſtinction than from the luſtre of their diadem. This ceremony was in its own origin ſimple and profane; the candidate, after ſome previous trial, was inveſted with his ſword and ſpurs; and his cheek or ſhoulder were touched with a ſlight blow, as an emblem of the laſt affront which it was lawful for him to endure. But ſuperſtition mingled in every public and private action of life: In the holy wars, it ſanctified the profeſſion of arms; and the order of chivalry was aſſimilated in its rights and privileges to the ſacred orders of prieſthood. The bath and white garment of the novice were an indecent copy of the regeneration of baptiſm: his ſword, which he offered on the altar, was bleſſed by the miniſters of religion; his ſolemn reception was preceded by faſts and vigils; and he was created a knight in the name of God, of St George, and of St Michael the archangel. He ſwore to accompliſh the duties of his profeſſion; and education, example, and the public opinion, were the inviolable guardians of his oath. As the champion of God and the ladies, he devoted himſelf to ſpeak the truth; to maintain the right; to protect the diſtreſſed; to practiſe *courteſy*, a virtue leſs familiar to the ancients; to purſue the infidels; to deſpiſe the allurements of eaſe and ſafety; and to vindicate in every perilous adventure the honour of his character. The abuſe of the ſame ſpirit provoked the illiterate knight to diſdain the arts of induſtry and peace; to eſteem himſelf the ſole judge and avenger of his own injuries; and proudly to neglect the laws of civil ſociety and military diſcipline. Yet the benefits of this inſtitution, to refine the temper of barbarians, and to infuſe ſome principles of faith, juſtice, and humanity, were ſtrongly felt, and have been often obſerved. The aſperity of national prejudice was ſoftened; and the community of religion and arms ſpread a ſimilar colour and generous emulation over the face of Chriſtendom. Abroad, in enterpriſe and pilgrimage; at home, in martial exerciſe, the warriors of every country were perpetually aſſociated; and impartial taſte muſt prefer a Gothic tournament to the Olympic games of claſſic antiquity. Inſtead of the naked ſpectacles which corrupted the manners of the Greeks, and baniſhed from the ſtadium the virgins and matrons, the pompous decoration of the liſts was crowned with the preſence of the chaſte and high-born beauty, from whoſe hands the conqueror received the prize of his dexterity and courage. The ſkill and ſtrength that were exerted in wreſtling and boxing, bear a diſtant and doubtful relation to the merit of a ſoldier; but the tournaments, as they were invented in France, and eagerly adopted both in the eaſt and weſt, preſented a lively image of the buſineſs of the field. The ſingle combats, the general ſkirmiſh, the defence of a paſs or caſtle, were rehearſed as in actual ſervice; and the conteſt, both in real and mimic war, was decided by the ſuperior management of the horſe and lance. The lance was the proper and peculiar weapon of the knight: his horſe was of a large and heavy breed; but this charger, till he was rouſed by the approaching danger, was uſually led by an attendant, and he quietly rode a pad or palfrey of a more eaſy pace. His helmet and ſword, his greaves and buckler, it would be ſuperfluous to deſcribe; but I may remark, that at the period of the cruſades, the armour was leſs ponderous than in later times; and that, inſtead of a maſſy cuiraſs, his breaſt was defended by a hauberk or coat of mail. When their long lances were fixed in the reſt, the warriors furiouſly ſpurred their horſes againſt the foe; and the light cavalry of the Turks and Arabs could ſeldom ſtand againſt the direct and impetuous weight of their charge. Each knight was attended to the field by his faithful ſquire, a youth of equal birth and ſimilar hopes; he was followed by his archers and men at arms; and four, or five, or ſix ſoldiers, were computed as the furniture of a complete *lance*. In the expeditions to the neighbouring kingdoms or the Holy Land, the duties of the feudal tenure no longer ſubſiſted; the voluntary ſervice of the knights and their followers was either prompted by zeal or attachment, or purchaſed with rewards and promiſes; and the numbers of each ſquadron were meaſured by the power, the wealth, and the fame of each independent chieftain. They were diſtinguiſhed by his banner, his armorial coat, and his cry of war: and the moſt ancient families of Europe muſt ſeek in theſe atchievements the origin and proof of their nobility."

The reſpectable author of the Letters on Chivalry and Romance, traces, with great ingenuity and erudition, a ſtrong reſemblance between the manners of the age of chivalry and thoſe of the old heroic ages delineated by Homer.

16
The reſemblance between heroic and Gothic manners.

There is, ſays he, a remarkable correſpondence between the manners of the old heroic times, as painted by their great romancer Homer, and thoſe which are repreſented to us in the modern books of knight-errantry. A fact of which no good account can be given, but by another not leſs certain; that the political ſtate of Greece, in the earlieſt periods of its ſtory, was ſimilar in many reſpects to that of Europe, as broken by the feudal ſyſtem into an infinite number of petty independent governments.

Some obvious circumſtances of agreement between the heroic and Gothic manners may be worth putting down.

1. The military enthuſiaſm of the barons is but of a piece with the fanaticiſm of the heroes. Hence the ſame particularity of deſcription in the accounts of battles, wounds, deaths, in the Greek poet as in the Gothic romancers. Hence the minute curioſity in the diſplay of their dreſſes, arms, accoutrements. The minds of all men being occupied with warlike images and ideas, were much gratified by thoſe details, which appear cold and unaffecting to modern readers.

We hear much of knights errant encountering giants and quelling ſavages in books of chivalry. Theſe giants were oppreſſive feudal lords; and every lord was to be met with, like the giant, in his ſtrong-hold or caſtle. Their dependents of a lower form, who imitated the violence of their ſuperiors, and had not their caſtles but lurking places, were the ſavages of romance. The greater lord was called a giant for his power; the leſs, a ſavage for his brutality.

2. Another terror of the Gothic ages was monſters, dragons, and ſerpents. Their ſtories were received in thoſe days for ſeveral reaſons: 1. From the vulgar belief of enchantments: 2. From their being reported on the faith of eaſtern tradition, by adventurers from the Holy Land: 3. In ſtill later times, from the ſtrange things told and believed on the diſcovery of the new world.

In all theſe reſpects, Greek antiquity reſembles the Gothic. For what are Homer's Læſtrigons and Cyclops, but bands of lawleſs ſavages, with each of them a giant of enormous ſize at their head? And what are the Grecian Bacchus, Hercules, and Theſeus, but knights-errant, the exact counterparts of Sir Launcelot and Amadis de Gaul?

3. The oppreſſions which it was the glory of the knights to avenge, were frequently carried on, as we are told, by the *charms and enchantments of women*. Theſe charms, we may ſuppoſe, are often metaphorical; as expreſſing only the blandiſhments of the ſex. Sometimes they are taken to be real, the ignorance of thoſe ages acquieſcing in ſuch conceits. And are not theſe ſtories matched by thoſe of Calypſo and Circe, the enchantreſſes of the Greek poet?

4. Robbery and piracy were honourable in both: ſo far were they from reflecting any diſcredit on the ancient or modern *redreſſers of wrongs*. What account can be given of this, but that, in the feudal times, and in the early days of Greece, when government was weak, and unable to redreſs the injuries of petty ſovereigns, it would be glorious for private adventurers to undertake this work; and, if they could accompliſh it in no other way, to pay them in kind by downright plunder and rapine?

5. Baſtardy was in credit with both. They were extremely watchful over the chaſtity of their own women; but ſuch as they could ſeize upon in the enemy's quarter, were lawful prize. Or if, at any time, they tranſgreſſed in this ſort at home, the fault was covered by an ingenious fiction. The offspring was reputed divine. Their greateſt heroes were the fruit of goddeſſes approached by mortals; juſt as we hear of the doughtieſt knights being born of fairies.

6. With the greateſt fierceneſs and ſavageneſs of character, the utmoſt generoſity, hoſpitality, and courteſy,

teſy, were imputed to the heroic ages. Achilles was at once the moſt relentleſs, vindictive, implacable, and the friendlieſt of men. We have the very ſame repreſentation in the Gothic romances. As in thoſe lawleſs times, dangers and diſtreſſes of all kinds abounded, there would be the ſame demand for compaſſion, gentleneſs, and generous attachments to the unfortunate, thoſe eſpecially of their own clan, as of reſentment, rage, and animoſity againſt their enemies.

7. Again, the martial games celebrated in ancient Greece, on great and ſolemn occaſions, had the ſame origin and the ſame purpoſe as the tournaments of the Gothic warriors.

8. Laſtly, the paſſions for adventures ſo natural in their ſituation, would be as naturally attended with the love of praiſe and glory. Hence the ſame encouragement, in the old Greek and Gothic times, to panegyriſts and poets. In the affairs of religion and gallantry, indeed, the reſemblance between the hero and the knight is not ſo ſtriking. But the religious character of the knight was an accident of the times, and no proper effect of his civil condition. And that his devotion for the fair ſex ſhould ſo far ſurpaſs that of the hero, is a confirmation of the ſyſtem here advanced. For the conſideration had of the females in the feudal conſtitution, will of itſelf account for this deference. It made them capable of ſucceeding to fiefs, as well as the men. And does not one inſtantly perceive what reſpect and dependence this privilege would draw upon them?

It was of great conſequence who ſhould obtain the favour of a rich heireſs. And though, in the ſtrict feudal times, ſhe was ſuppoſed to be in the power and at the diſpoſal of her ſuperior lord, yet this rigid ſtate of things did not laſt long. Hence we find ſome diſtreſſed damſel was the ſpring and mover of every knight's adventure. She was to be reſcued by his arms, or won by the fame and admiration of his proweſs. The plain meaning of all which was this: That as, in theſe turbulent times, a protector was neceſſary to the weakneſs of the ſex, ſo the courteous and valorous knight was to approve himſelf fully qualified for that purpoſe.

It may be obſerved, that the two poems of Homer were intended to expoſe the miſchiefs and inconveniences ariſing from the political ſtate of Old Greece: the *Iliad*, the diſſenſions that naturally ſpring up among independent chiefs; and the *Odyſſey*, the inſolence of their greater ſubjects, more eſpecially when unreſtrained by the preſence of their ſovereign. And can any thing more exactly reſemble the condition of the feudal times, when, on occaſion of any great enterpriſe, as that of the cruſades, the deſigns of the confederate Chriſtian ſtates were perpetually fruſtrated, or interrupted at leaſt, by the diſſenſions of their leaders; and their affairs at home, as perpetually diſtreſſed and diſordered by the rebellious uſurpations of their greater vaſſals? Jeruſalem was to the European what Troy had been to the Grecian princes. See the article Knight.

Chivalry, in *Law*, is uſed for a tenure of lands by knight's ſervice, whereby the knight was bound to perform ſervice in war unto the king, or the meſne lord of whom he held by that tenure. And chivalry was either general or ſpecial: *general*, when it was only in the feoffment that the tenant held *per ſervitium militare*, without any ſpecification of ſerjeantry, eſcuage, &c.; *ſpecial*, when it was declared particularly by what kind of knight ſervice the land was held.

For the better underſtanding of this tenure it hath been obſerved, that there is no law but is holden mediately or immediately of the crown by ſome ſervice; and therefore all freeholds that are to us and our heirs, are called *feuda* or *feoda*, "fees;" as proceeding from the king for ſome ſmall yearly rent, and the performance of ſuch ſervices as were originally laid upon the land at the donation thereof. For as the king gave to the great nobles, his immediate tenants, large poſſeſſions for ever, to hold of him for this or that ſervice or rent; ſo they in time parcelled out to ſuch others as they liked the ſame lands for rents and ſervices as they thought good; and theſe ſervices were by Littleton divided into two kinds, *chivalry* and *ſocage*; the firſt whereof was martial and military, the other ruſtical. Chivalry, therefore, was a tenure of ſervice, whereby the tenant was obliged to perform ſome noble or military office unto his lord: and it was of two kinds; either *regal*, that is, held only of the king; or *common*, where held of a common perſon. That which might be held only of the king was called *ſervitium*, or *ſergentia*; and was again divided into *grand* and *petit* ſerjeantry. The grand ſerjeantry was where one held lands of the king by ſervice, which he ought to do in his own perſon; as, to bear the king's banner or ſpear, to lead his hoſt, to find men at arms to fight, &c. Petit ſerjeantry was when a man held lands of the king, to yield him annually ſome ſmall thing towards his wars, as a ſword, dagger, bow, &c. Chivalry that might be holden of a common perſon was termed *ſcutagium*, "eſcuage;" that is, ſervice of the ſhield; which was either uncertain or certain.

Eſcuage uncertain, was likewiſe two-fold: firſt, where the tenant was bound to follow his lord, going in perſon to the king's wars, either himſelf, or ſending a ſufficient man in his place, there to be maintained at his expence, ſo long as was agreed upon between the lord and his firſt tenant at the granting of the fee: and the days of ſuch ſervice ſeem to have been rated by the quantity of land ſo holden; as, if it extended to a whole knight's fee, then the tenant was to follow his lord 40 days; and if but to half a knight's fee, then 20 days; if a fourth part, then 10 days, &c. The other kind of this eſcuage was called *caſtle ward*, where the tenant was obliged, by himſelf or ſome other, to defend a caſtle as often as it ſhould come to his turn. And theſe were called *eſcuage uncertain*; becauſe it was uncertain how often a man ſhould be called to follow his lord to the wars, or to defend a caſtle, and what his charge would be therein.

Eſcuage certain, was where the tenure was ſet at a certain ſum of money to be paid in lieu of ſuch ſervice; as that a man ſhould pay yearly for every knight's fee 20s. for half a knight's fee 10s. or ſome like rate; and this ſervice, becauſe it is drawn to a certain rent, groweth to be of a mixed nature, not merely ſocage, and yet ſocage in effect, being now neither perſonal ſervice nor uncertain. The tenure called chivalry had other conditions annexed to it: but there is a great alteration made in theſe things by the ſtat. 12. Car. II. c. 24. whereby tenures by knight's ſervice of the king, or any other perſon *in capite*, &c. and the fruits and conſequences thereof, are taken away and diſcharged; and all tenures are to be conſtrued and adjudged to be free and common ſocage, &c.

Court of CHIVALRY, a court formerly held before the lord high conſtable and earl marſhal of England jointly, and having both civil and criminal juriſdiction; but ſince the attainder of Stafford duke of Buckingham under Henry VIII. and the conſequent extinguiſhment of the office of lord high conſtable, it hath uſually, with reſpect to civil matters, been heard before the earl marſhal only. This court, by ſtat. 13. Rich. II. c. 2. hath cognizance of contracts and other matters touching deeds of arms and war, as well out of the realm as in it. And from its ſentences lies an immediate appeal to the king in perſon. This court was in great reputation in the times of pure chivalry; and afterwards during the Engliſh connexions with the continent, by the territories which their princes held in France; but it is now grown almoſt entirely out of uſe, on account of the feebleneſs of its juriſdiction, and want of power to enforce its judgements; as it can neither fine nor impriſon, not being a court of record.

1. The *civil* juriſdiction of this court of chivalry is principally in two points; the redreſſing injuries of honour, and correcting encroachments in matters of coat-armour, precedency, and other diſtinctions of families. As a court of honour, it is to give ſatisfaction to all ſuch as are aggrieved in that point; a point of a nature ſo nice and delicate, that its wrongs and injuries eſcape the notice of the common law, and yet are fit to be redreſſed ſomewhere. Such, for inſtance, as calling a man *coward*, or giving him the lie; for which, as they are productive of no immediate damage to his perſon or property, no action will lie in the courts at Weſtminſter; and yet they are ſuch injuries as will prompt every man of ſpirit to demand ſome honourable amends; which, by the ancient law of the land, was given in the court of chivalry. But modern reſolutions have determined, that how much ſoever a juriſdiction may be expedient, yet no action for words will at preſent lie therein. And it hath always been moſt clearly holden, that as this court cannot meddle with any thing determinable by common law, it therefore can give no pecuniary ſatiſfaction or damages; inaſmunch as the quantity and determination thereof is ever of common law cognizance. And therefore this court of chivalry can at moſt order reparation in point of honour; as to compel the defendant *mendacium ſibi ipſi imponere*, or to take the lie that he has given upon himſelf, or to make ſuch other ſubmiſſion as the laws of honour may require. As to the other point of its civil juriſdiction, the redreſſing of uſurpations and encroachments in matters of heraldry and coat-armour; it is the buſineſs of this court, according to Sir Matthew Hale, to adjuſt the right and armorial enſigns, bearings, creſts, ſupporters, pennons &c.; and alſo rights of places or precedence, where the king's patent or act of parliament, which cannot be overruled by this court, have not already determined it. The proceedings of this court are by petition in a ſummary way; and the trial not by a jury of 12 men, but by witneſſes, or by combat. But as it cannot impriſon, not being a court of record; and as, by the reſolutions of the ſuperior courts, it is now confined to ſo narrow and reſtrained a juriſdiction, it has fallen into contempt. The marſhalling of coat-armour, which was formerly the pride and ſtudy of all the beſt families in the kingdom, is now greatly diſregarded; and has fallen into the hands of certain officers and atendants upon this court, called *heralds*, who conſider it only as a matter of lucre, and not of juſtice; whereby ſuch falſity and confuſion have crept into their records (which ought to be the ſtanding evidence of families, deſcents, and coat-armour), that though formerly ſome credit has been paid to their teſtimony, now even their common ſeal will not be received as evidence in any court of juſtice in the kingdom. But their original viſitation books, compiled when progreſſes were ſolemnly and regularly made in every part of the kingdom, to inquire into the ſtate of families, and to regiſter ſuch marriages and deſcents as were verified to them upon oath, are allowed to be good evidence of pedigrees.

2. As a *criminal* court, when held before the lord high conſtable of England jointly with the earl marſhal, it had juriſdiction over pleas of life and member, ariſing in matters of arms and deeds of war, as well out of the realm as within it. But the criminal as well as civil part of its authority is fallen into entire diſuſe, there having been no permanent high conſtable of England (but only *pro hac vice*, at coronations and the like), ſince the attainder and execution of Stafford duke of Buckingham, in the 13th year of Henry VIII.; the authority and charge, both in war and peace, being deemed too ample for a ſubject; ſo ample, that when the chief juſtice Fineux was aſked by King Henry VIII. how far they extended? he declined anſwering, and ſaid, the deciſion of that queſtion belonged to the law of arms, and not to the law of England.

CHIVES, in *Botany*, are ſlender thread like ſubſtances, generally placed within the bloſſom, and ſurrounding the POINTALS. They are formed of the woody ſubſtance of the plant.

CHIUM MARMOR, in the natural hiſtory of the ancients, the name of a black marble, called alſo the *lapis opſidianus*. It is very hard, and of a fine black; and, beſide the many uſes which the ancients put it to, is well known among our goldſmiths by the name of the *touchſtone*; moſt of them being furniſhed with nothing better for this purpoſe than a piece of this: though the baſaltes, which may be had plentifully enough, is greatly preferable for thoſe uſes; any black marble, however, that is tolerably hard, will do. There is a very fine and elegantly ſmooth marble, of a compact texture, and fine gloſſy black, but ſhowing no glittering particles when freſh broken, as moſt of the black marbles do. It is extremely hard, and cuts with difficulty, but is capable of the higheſt poliſh of any marble. The ancients had it from Ethiopia and the iſland of Chios; we have it from Italy.

CHIUM Vinum, *Chian Wine*, or wine of the growth of the iſland of Chios, now Scio, is commended by Dioſcorides as affording good nouriſhment, fit to drink, leſs diſpoſed to intoxicate, endued with the virtue of reſtraining defluxions, and a proper ingredient in ophthalmic medicines. Hence Scribonius Largus directs the dry ingredients in collyria for the eyes to be made up with Chian wine.

CHIUN, or Chevan, in Hebrew antiquity. We meet with this word in the prophet Amos, cited in the Acts of the Apoſtles. St Luke reads the paſſage thus: "Ye took up the tabernacle of Moloch, and the ſtar of your god Remphan, figures which ye made to worſhip them." The import of the Hebrew is as follows: "Ye have borne the tabernacle of your kings, and the pedeſtal (the *chiun*) of your images, the ſtar of your gods, which ye made to yourſelves." The Septuagint in all probability read *Repham* or *Revan*, inſtead of *Chiun* or *Chevan*, and took the pedeſtal for a god.

Some ſay that the Septuagint, who made their tranſlation in Egypt, changed the word *Chiun* into that of *Remphan*, becauſe they had the ſame ſignification. M. Baſnage, in his book entitled *Jewiſh Antiquities*, after having diſcourſed a good deal upon *Chion* or *Remphan*, concludes that Moloch was the ſun, and *Chion*, *Chiun*, or *Remphan*, the moon.

CHLAMYS, in antiquity, a military habit worn by the ancients over the tunica. It belonged to the patricians, and was the ſame in the time of war that the toga was in the time of peace. This ſort of gown was called *picta*, from the rich embroidery with figures in Phrygian work; and *purpurea*, becauſe the groundwork was purple. The chlamydes of the emperors were all purple, adorned with a golden and embroidered border.

CHLOEIA, in antiquity, a feſtival celebrated at Athens in honour of Ceres, to whom, under the name χλοη, *i. e. graſs*, they ſacrificed a ram.

CHLORA. See Botany *Index*.

CHLOROSIS, in *Medicine*, a diſeaſe, commonly called the *green ſickneſs*, incident to young girls. See *Medicine Index*.

CHOCOLATE, in commerce, a kind of paſte or cake prepared of certain ingredients, the baſis of which is cacao. See Cacao.

The Indians, in their firſt making of chocolate, uſed to roaſt the cacao in earthen pots; and having afterwards cleared it of the huſks, and bruiſed it between two ſtones, they made it into cakes with their hands. The Spaniards improved this method. When the cacao is properly roaſted and well cleaned, they pound it in a mortar, to reduce it into a coarſe maſs, which they afterwards grind on a ſtone till it be of the utmoſt fineneſs: the paſte being ſufficently ground, is put quite hot into tin moulds, in which it congeals in a very little time. The form of theſe moulds is arbitrary; the cylindrical ones, holding two or three pounds, are the moſt proper, becauſe the bigger the cakes are, the longer they will keep. Obſerve, that theſe cakes are very liable to take any good or bad ſcent, and therefore they muſt be carefully wrapt up in paper, and kept in a dry place. Complaints are made, that the Spaniards mix with the cacao nuts too great a quantity of cloves and cinnamon, beſides other drugs without number, as muſk, ambergris, &c. The grocers of Paris uſe few or none of theſe ingredients; they only chooſe the beſt nuts, which are called *caracca*, from the place from whence they are brought; and with theſe they mix a very ſmall quantity of cinnamon, the freſheſt vanilla, and the fineſt ſugar, but very ſeldom any cloves. In England the chocolate is made of the ſimple cacao, excepting that ſometimes ſugar and ſometimes vanilla is added.

Chocolate ready made, and cacao paſte, are prohibited to be imported from any part beyond the ſeas. If made and ſold in Great Britain, it pays inland duty 1s. 6d. per lb. avoirdupoiſe: it muſt be incloſed in papers containing one pound each, and produced at the exciſe office to be ſtamped. Upon three days notice given to the officer of exciſe, private families may make chocolate for their own uſe, provided no leſs than half an hundred weight of nuts be made at one time.

The chocolate made in Portugal and Spain is not near ſo well prepared as the Engliſh, depending perhaps on the machine employed there, viz. the double cylinder, which ſeems very well calculated for exact triture. If perfectly prepared, no oil appears on the ſolution. London chocolate gives up no oil like the foreign; and it alſo may in ſome meaſure depend on the thickneſs of the preparation. The ſolution requires more care than is commonly imagined. It is proper to break it down, and diſſolve it thoroughly in cold water by milling it with the chocolate ſtick. If heat is applied, it ſhould be done ſlowly; for, if ſuddenly, the heat will not only coagulate it, but ſeparate the oil; and therefore much boiling after it is diſſolved is hurtful. Chocolate is commonly required by people of weak ſtomachs; but often rejected for want of proper preparation. When properly prepared, it is eaſily diſſolved; and an excellent food where a liquid nutrient vegetable one is required, and is leſs flatulent than any of the farinacea.

Mr Henley, an ingenious electrician, has lately diſcovered that chocolate, freſh from the mill, as it cools in the tin pans into which it is received, becomes ſtrongly electrical; and that it retains this property for ſome time after it has been turned out of the pans, but ſoon loſes it by handling. The power may be once or twice renewed by melting it again in an iron ladle, and pouring it into the tin-pans as at firſt; but when it becomes dry and powdery, the power is not capable of being revived by ſimple melting: but if a ſmall quantity of olive-oil be added, and well mixed with the chocolate in the ladle, its electricity will be completely reſtored by cooling it in the tin-pan as before. From this experiment he conjectures, that there is a great affinity between carbonic acid and the electric fluid, if indeed they be not the ſame thing.

Chocolate Nut Tree. See Cacao.

CHOENIX, χοινιξ, an ancient dry meaſure, containing the 48th part of a *medimnus*, or ſix buſhels.

CHOERILUS, a tragic poet of Athens about the 64th Olympiad. He wrote 150 tragedies, of which 13 had obtained the prize.—An hiſtorian of Samos.—Two other poets, one of whom was very intimate with Herodotus. He wrote a poem on the victory which the Athenians had obtained over Xerxes; and on account of the excellence of the compoſition he received a piece of gold for each verſe from the Athenians. The other was one of Alexander's flatterers and friends.

CHOERINÆ, in antiquity, a kind of ſea-ſhells, with which the ancient Greeks uſed to give their ſuffrage, or vote.

CHOIR, that part of the church or cathedral where choriſters ſing divine ſervice; it is ſeparated from the chancel where the communion is celebrated, and alſo from the nave of the church where the people are placed: the patron is ſaid to be obliged to repair the choir of the church. It was in the time of Conſtantine that the choir was ſeparated from the nave. In the 12th century they began to encloſe it with walls; but the ancient balluſtrades have been ſince reſtored, out of a view to the beauty of architecture.

Choir, in nunneries, is a large hall adjoining to the body of the church, ſeparated by a grate, where the nuns ſing the office.

CHOISI, Francis Timoleon de, dean of the cathedral of Bayeux, and one of the forty of the French academy, was born at Paris in 1644. In the early part of his life he was much diſtinguiſhed by his frivolous manners, and particularly by appearing even at court in a female dreſs. In 1685 he was ſent with the chevalier de Chaumont to the king of Siam, and was ordained prieſt in the Indies by the apoſtolical vicar. He wrote a great number of works, in a polite, florid, and eaſy ſtyle; the principal of which are, 1. Four Dialogues on the Immortality of the Soul, &c. 2. Account of a Voyage to Siam. 3. An Eccleſiaſtical Hiſtory, in 11 vols. 4to. 4. Life of David, with an Interpretation of the Pſalms. 5. Life of Solomon, &c. He died at Paris in 1724.

CHOLEDOCHUS, in *Anatomy*, a term applied to a canal, or duct, called alſo *ductus communis*; formed of the union of the porus biliarus and ductus cyſticus. The word comes from χολη, *choler*: and δεχομαι, *I receive*, or *contain*.

The choledochus ductus, paſſing obliquely to the lower end of the duodenum, ſerves to convey the bile from the liver to the inteſtines. See Anatomy *Index*.

CHOLER. See Bile.

CHOLERA morbus, a ſudden eruption or overflowing of the bile or bilious matters both upwards and downwards. See Medicine *Index*.

CHOMER, or Omer. See Corus.

CHONDRILLA. See Botany *Index*.

CHONDROPTERYGII, in *Ichthyology*, a term formerly applied to the order of fiſhes now called *amphibia nantes* by Linnæus. See Amphibia.

CHOP church, or Church-chopper, a name, or rather a nick-name, given to parſons who make a practice of exchanging benefices. See Permutation.

Chop-church occurs in an ancient ſtatute as a lawful trade or occupation; and ſome of the judges ſay it was a good addition. Brook holds, that it was no occupation, but a thing permiſſible by law.

CHOPIN, or Chopine, a liquid meaſure uſed both in Scotland and France, and equal to half their pint. See Pint and Measure.

Chopine, *Rene*, a famous civilian born at Bailleul in Anjou in 1537. He was advocate in the parliament of Paris, where he pleaded for a long time with great reputation. He at laſt ſhut himſelf up in his cloſet, and compoſed many works, which have been collected together, and printed in 6 vols. folio. He died at Paris in 1606.

CHORAL, ſignifies any perſon that, by virtue of any of the orders of the clergy, was in ancient times admitted to ſit and ſerve God in the choir.

Dugdale, in his hiſtory of St Paul's church, ſays, that there were with the chorus formerly ſix vicars choral belonging to that church.

CHORASSAN, or Khorassan, a province of Perſia, adjoining to Uſbec Tartary. This was the ancient Bactria, and the birth-place of Kouli Khan.

CHORAX, or Charax. See Characene.

CHORAZIM, or Chorazin, (Luke, Matthew), a town of Galilee, whoſe wretched incredulity Chriſt deplores; now deſolate, at two miles diſtance from Capernaum.

CHORD, or Cord, primarily denotes a ſlender rope or cordage*. The word is formed of the Latin, *chorda*, and that from the Greek, χορδη, *a gut*, whereof ſtrings may be made.

Chord, in *Geometry*, a right line drawn from one part of an arch of a circle to another. Hence,

Chord of an Arch, is a right line joining the extremes of that arch.

Chord, in *Muſic*, the union of two or more ſounds uttered at the ſame time, and forming together an entire harmony.

The natural harmony produced by the reſonance of a ſounding body, is compoſed of three different ſounds, without reckoning their octaves; which form among themſelves the moſt agreeable and perfect chord that can poſſibly be heard: for which reaſon they are called, on account of their excellence, *perfect chords*. Hence, in order to render that harmony complete, it is neceſſary that each chord ſhould at leaſt conſiſt of three ſounds. The trio is likewiſe found by muſicians to include the perfection of harmony; whether becauſe in this all the chords, and each in its full perfection, are uſed; or, becauſe upon ſuch occaſions as render it improper to uſe them all, and each in its integrity, arts have been ſucceſsfully practiſed to deceive the ear, and to give it contrary perſuaſion, by deluding it with the principal ſounds of each *chord*, in ſuch a manner as to render it forgetful of the other ſounds neceſſary to their completion. Yet the octave of the principal ſound produces new relations, and new conſonances, by the completion of the intervals: they commonly add this octave, to have the aſſemblage of all the conſonances in one and the ſame *chord*; (See Consonance). Moreover, the addition of the diſſonance (See Discord), producing a fourth ſound ſuperadded to the perfect chord, it becomes indiſpenſably neceſſary, if we would render the chord full, that we ſhould include a fourth part to expreſs this diſſonance. Thus, the ſeries of chords can neither be complete nor connected but by means of four parts.

Chords are divided into perfect and imperfect. The *perfect chord* is that which we have lately deſcribed; which is compoſed of the fundamental ſound below, of its third, its fifth, and its octave: they are likewiſe ſubdivided into major and minor, according as the thirds which enter into their compoſition are flat or ſharp: (See Interval). Some authors likewiſe give the name of *perfect* to all chords, even to diſſonances, whoſe fundamental ſounds are below. Imperfect *chords* are thoſe in which the ſixth, inſtead of the fifth, prevails, and in general all thoſe whoſe loweſt are not their fundamental ſounds. Theſe denominations, which had been given before the fundamental baſs was known, are now moſt unhappily applied: thoſe of chords *direct* and *reverſed* are much more ſuitable in the ſame ſenſe.

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* See Cordage.

Chords are once more divided into conſonances and diſſonances. The chords denominated *conſonances*, are the perfect chord, and its derivatives; every other chord is a *diſſonance*.

A table of both, according to the ſyſtem of M. Rameau, may be ſeen in Rouſſeau's Muſical Dictionary, vol. i. p. 27.

After the table to which our readers have been remitted, Rouſſeau adds the following obſervations, which are at the ſame time ſo juſt and ſo important, that we ſhould be very ſorry if they eſcape the reader's attention.

At the words *harmony*, *fundamental baſs*, *compoſition*, &c, he promiſes to treat concerning the manner of uſing all the chords to form regular harmony; and only adds, in this place, the ſubſequent reflections.

1. It is a capital error to imagine, that the methods of inverting the ſame chord are in all caſes equally eligible for the harmony and for the expreſſion. There is not one of theſe different arrangements but had its proper character. Every one feels the contraſt between the ſoftneſs of the falſe fifth, and the grating ſound of the tritone, though the one of theſe intervals is produced by a method of inverting the other. With the ſeventh diminiſhed, and the ſecond redundant, the caſe is the ſame with the interval of the ſecond in general uſe, and the ſeventh. Who does not feel how much more vocal and ſonorous the fifth appears when compared with the fourth? The *chord* of the great ſixth, and that of the leſſer ſixth minor, are two forms of the ſame fundamental *chord*: but how much leſs is the one harmonious than the other? On the contrary, the *chord* of the leſſer ſixth major is much more pleaſing and cheerful than that of the falſe fifth. And only to mention the moſt ſimple of all *chords*, reflect on the majeſty of the perfect chord, the ſweetneſs of that which is called the chord of the ſixth, and the inſipidity of that which is compoſed of a ſixth and a fourth; all of them, however, compoſed of the ſame ſounds. In general, the redundant intervals, the ſharps on the higher part, are proper by their ſeverity to expreſs violent emotions of mind, ſuch as anger and the rougher paſſions. On the contrary, flats in the higher parts, and diminiſhed intervals, form a plaintive harmony, which melts the heart. There are a multitude of ſimilar obſervations, of which when a muſician knows how to avail himſelf, he may command at will the affections of thoſe who hear him.

2. The choice of ſimple intervals is ſcarcely of leſs importance than that of the *chords*, with regard to the ſtations in which they ought to be placed. It is, for inſtance, in the lower parts that the fifth and octave ſhould be uſed in preference; in the upper parts, the third and ſixth are more proper. If you tranſpoſe this order, the harmony will be ruined, even though the ſame *chords* are preſerved.

3. In a word, the *chords* are rendered ſtill more harmonious by being approximated and only divided by the ſmalleſt practicable intervals, which are more ſuitable to the capacity of the ear than ſuch as are remote. This is what we call *contracting* the harmony; an art which few compoſers have ſkill and abilities enough to put in practice. The limits in the natural compaſs of voices, afford an additional reaſon for leſſening the diſtance of the intervals, which compoſe the harmony of the chorus, as much as poſſible. We may affirm, that a chorus is improperly compoſed, when the diſtance between the *chords* increaſes; when thoſe who perform the different parts are obliged to ſcream when the voices riſe above their natural extent, and are ſo remotely diſtant one from the other that the perception of harmonical relations between them is loſt.

We ſay likewiſe, that an inſtrument is in *concord* when the intervals between its fixed ſounds are what they ought to be; we ſay in this ſenſe, that the *chords* of an inſtrument are true or falſe, that it preſerves or does not preſerve its *chords*. The ſame form of ſpeaking is uſed for two voices which ſing together, or for two ſounds which are heard at the ſame time, whether in uniſon or in parts.

CHORDS, or *Cords*, *of Muſical Inſtruments*, are ſtrings, by the vibration of which the ſenſation of ſound is excited, and by the diviſions of which the ſeveral degrees of tone are determined.

CHORDEE, in *Medicine* and *Surgery*, a ſymptom attending a gonorrhœa, conſiſting in a violent pain under the frenum, and along the duct of the urethra, during the erection of the penis, which is incurvated downwards. Theſe erections are frequent and involuntary.

CHOREA SANCTI VITI. See *VITUS's Dance*.

CHOREPISCOPUS, an officer in the ancient church, about whoſe function the learned are extremely divided. The word comes from χωρος, a *region* or *little country*, and επισκοπος, a *biſhop* or *overſeer*.

The chorepiſcopi were ſuffragan or local biſhops, holding a middle rank between biſhops and preſbyters, and delegated to exerciſe epiſcopal juriſdiction within certain diſtricts, when the boundaries of particular churches, over which ſeparate biſhops preſided, were conſiderably enlarged. It is not certain when this office was firſt introduced: ſome trace it to the cloſe of the firſt century: others tell us, that chorepiſcopi were not known in the eaſt till the beginning of the fourth century; and in the weſt about the year 439. They ceaſed both in the eaſt and weſt in the tenth century.

CHOREPISCOPUS is alſo the name of a dignity ſtill ſubſiſting in ſome cathedrals, particularly in Germany; ſignifying the ſame with *chori epiſcopus*, or "biſhop of the choir." The word, in this ſenſe, does not come from χωρος, *place*, but χορος, *choir*, &c. In the church of Cologne, &c. the firſt chanter is called *chorepiſcopus*.

CHOREUS, χορειος, a foot in the ancient poetry, more commonly called *trochæus*. See TROCHEE.

CHORIAMBUS, in ancient poetry, a foot conſiſting of four ſyllables, whereof the firſt and laſt are long, and the two middle ones are ſhort; or, which is the ſame thing, it is made up of a trochæus and iambus: ſuch is the word *nobilitas*.

CHORION, in *Anatomy*, the exterior membrane which inveſts the fœtus in the uterus. See Foetus.

CHOROBATA, or Chorobates, a kind of water level among the ancients, of the figure of the letter T, according to Vitruvius's deſcription.

CHOROGRAPHY, the art of making a map of any country or province.

Chorography differs from geography, as the deſcription of a particular country differs from that of the whole earth; and from topography, as the deſcription of a country is different from that of a town or diſtrict. See the articles Geography, Topography, and Map.

CHOROIDES, or Choroeides, in *Anatomy*, a term applied to ſeveral parts of the body, bearing ſome reſemblance to the chorion. The word is formed from χοριον, *chorion*, and ειδος, *likeneſs*.

Choroides is particularly uſed for the inner membrane which immediately inveſts the brain; ſo called as being intermingled with a great number of blood-veſſels, like the *chorion*: but more uſually denominated the *pia mater* or *meninx tenuis*.

Plexus or *Lacis Choroides*, is a knot of veins and arteries in the anterior ventricle of the brain, woven out of the branches of the carotid.

Choroides is alſo applied to the inner and poſterior tunic of the eye, immediately under the ſclerotica. It is ſoft, thin, and black: and its inner or concave ſurface is very ſmooth and poliſhed. It has its name from its being interſperſed with veſſels.

CHORUS, in dramatic poetry, one or more perſons preſent on the ſtage during the repreſentation, and ſuppoſed to be by-ſtanders without any ſhare in the action.

Tragedy in its origin was no more than a ſingle chorus, who trode the ſtage alone, and without any actors, ſinging dithyrambics or hymns in honour of Bacchus. Theſpis, to relieve the chorus, added an actor, who rehearſed the adventures of ſome of their heroes; and Æſchylus, finding a ſingle perſon too dry an entertainment, added a ſecond, at the ſame time reducing the ſinging of the chorus, to make more room for the recitation. But when once tragedy began to be formed, the recitative, which at firſt was intended only as an acceſſary part to give the chorus a breathing time, became a principal part of the tragedy. At length, however, the chorus became inſerted and incorporated into the action: ſometimes it was to ſpeak; and then their chief, whom they called *coryphæus*, ſpoke in behalf of the reſt: the ſinging was performed by the whole company; ſo that when the coryphæus ſtruck into a ſong, the chorus immediately joined him.

The chorus ſometimes alſo joined the actors, in the courſe of the repreſentation, with their plaints and lamentations on account of any unhappy accidents that befel them; but the proper function, and that for which it ſeemed chiefly retained, was to ſhow the intervals of the acts: while the actors were behind the ſcenes, the chorus engaged the ſpectators; their ſongs uſually turned on what was exhibited, and were not to contain any thing but what was ſuited to the ſubject, and had a natural connection with it; ſo that the chorus concurred with the actors for advancing the action. In the modern tragedies the chorus is laid aſide, and the fiddles ſupply its place. M. Dacier looks on this retrenchment as of ill conſequence, and thinks it robs tragedy of a great part of its luſtre; he therefore judges it neceſſary to re-eſtabliſh it, not only on account of the regularity of the piece, but alſo to correct, by prudent and virtuous reflections, any extravagances that might fall from the mouths of the actors when under any violent paſſion.

M. Dacier obſerved alſo, that there was a chorus, or grex, in the ancient comedy: but this is ſuppreſſed in the new comedy, becauſe it was uſed to reprove vices by attacking particular perſons; as the chorus of the tragedy was laid aſide to give the greater probability to thoſe kinds of intrigue which require ſecrecy.

Chorus, in *Muſic*, is when, at certain periods of a ſong, the whole company are to join the ſinger in repeating certain couplets or verſes.

CHOSE (*Fr.*), "a thing;" uſed in the common law with divers epithets; as *choſe local*, *choſe tranſitory*, and *choſe in action*. Choſe local is ſuch a thing as is annexed to a place, as a mill and the like; choſe tranſitory is that thing which is moveable, and may be taken away, or carried from place to place; and choſe in action is a thing incorporeal, and only a *right*, as an obligation for debt, annuity, &c. And generally all cauſes of ſuit for any debt, duty, or wrong, are to be accounted choſes in action: and it ſeems, choſe in action may be alſo called *choſe in ſuſpenſe*; becauſe it hath no real exiſtence or being, nor can properly be ſaid to be in our poſſeſſion.

CHOSROES I. the Great, king of Perſia after his father Cabades, A. D. 532. He made peace with the Romans; but broke it the third year, and forced Juſtinian to a diſadvantageous peace. Afterwards, he was ſo ſwelled with his victories, as to bid the emperor's ambaſſador follow him for audience to Cæſarea; but Tiberius ſent an army under Juſtinian, who made himſelf maſter of the country, and put Choſroès to death in 586.

Chosroes II. His ſubjects put his father Hormiſdas in priſon, and the ſon upon the throne of Perſia. He uſed his father tenderly at firſt; but afterwards cauſed him to be put to death. This, together with his killing ſome of the nobility, obliged him to fly: he gave his horſe the bridle, which carried him into a town of the Romans, where Mauricius the emperor received him kindly, and ſent an army under Narſes which ſet him again upon the throne. He took Jeruſalem; after this he made himſelf maſter of Lybia and Egypt, and carried Carthage. Heraclius ſued for peace; which was offered him on condition, *That he and his ſubjects ſhould deny Jeſus Chriſt*: Hereupon Heraclius attacked him with ſucceſs, and put him to flight. His own ſon purſued him, and he was ſtarved in priſon in 627.

CHOUGH, in *Ornithology*, the trivial name of a ſpecies of Corvus.

CHOUS, in the eaſtern military orders, the title of the meſſengers of the divan Janiſaries. There are ſeveral degrees of honour in this poſt. When a perſon is firſt advanced to it, he is called a *kuchuk*, or little *chous*; after this he is advanced to be the *alloy chous*, that is, the meſſenger of ceremonies; and from this, having paſſed through the office of *petelma*, or procurator of the effects of the body, he is advanced to be the *bas chous*.

CHOWDER-BEER, a provincial phraſe of Devonſhire, denoting a cheap and eaſily prepared drink, highly commended for preventing the ſcurvy in long voyages, or for the cure of it where it may have been contracted. It is prepared in the following manner: Take twelve gallons of water, in which put three pounds and a half of black ſpruce: boil it for three hours, and having taken out the fir or ſpruce, mix with the liquor ſeven pounds of melaſſes, and juſt boil it up; ſtrain it through a ſieve, and when milk-warm put to it about four ſpoonfuls of yeaſt to work it. In two or three days ſtop the bung of the caſk; and in five or ſix days, when fine, bottle it for drinking. Two gallons of melaſſes are ſufficient for a hogſhead of liquor; but if melaſſes cannot be procured, treacle or coarſe ſugar will anſwer the purpoſe.

CHREMNITZ, the principal of the nine towns in Upper Hungary, ſituated about 68 miles north-eaſt of Preſburg, and ſubject to the houſe of Auſtria. E. Long. 19. N. Lat. 48. 45.

CHRENECRUDA, a term occurring in writers of the middle ages, and expreſſing a cuſtom of thoſe times; but its ſignification is doubtful. It is mentioned in *Lege Salica*, tit. 61. which ſays, he who kills a man, and hath not wherewithal to ſatisfy the law or pay the fine, makes oath that he hath delivered up every thing he was poſſeſſed off; the truth of which muſt be confirmed by the oaths of 12 other perſons. Then he invites his next relations by the father's ſide to pay off the remainder of the fine, having firſt made over to them all his effects by the following ceremony. He goes into his houſe, and taking in his hand a ſmall quantity of duſt from each of the four corners, he returns to the door, and with his face inwards throws the duſt with his left hand over his ſhoulders upon his neareſt of kin. Which done, he ſtrips to his ſhirt; and coming out with a pole in his hand, jumps over the hedge. His relations, whether one or ſeveral, are upon this obliged to pay off the compoſition for the murder. And if theſe (or any one of them) are not able to pay *iterum ſuper illum chrenecruda, qui pauperior eſt, jactat, et ille totam legem componat.* Whence it appears, that *chrenecruda jactare*, is the ſame with throwing the duſt gathered from the four corners of the houſe. Goldaſtus and Spelman tranſlate it *viridem herbam*, "green graſs," from the German *gruen kraut*, or from the Dutch *groen*, "green," and *gruid*, "graſs." Wendelinus is of a contrary opinion, who thinks that by this word *denotari purificationis approbationem*, from *chrein*, "pure, chaſte, clean;" and *keuren*, "to prove;" ſo that it muſt refer to the oaths of the twelve jurors. Be this as it will, King Childebert reformed this law by a decree, chap. 15. both becauſe it favoured of Pagan ceremonies, and becauſe ſeveral perſons were thereby obliged to make over all their effects: *De chrenecruda lex quam paganorum tempore obſervabant, deinceps nunquam valeat, quia per ipſam cecidet multorum poteſtas.*

CHRISM (from χριω, *I anoint*), oil conſecrated by the biſhop, and uſed in the Romiſh and Greek churches, in the adminiſtration of baptiſm, confirmation, ordination, and extreme unction, which is prepared on holy Thurſday with much ceremony. In Spain it was anciently the cuſtom for the biſhop to take one-third of a ſol for the chriſm diſtributed to each church, on account of the balſam that entered its compoſition.

Du Cange obſerves, that there are two kinds of chriſm; the one prepared of oil and balſam, uſed in baptiſm, confirmation, and ordination; the other of oil alone, conſecrated by the biſhop, uſed anciently for the catechumens, and ſtill in extreme unction. The Maronites, before their reconciliation with Rome, beſides oil and balſam, uſed muſk, ſaffron, cinnamon, roſes, white frankincenſe, and ſeveral other drugs mentioned by Rynaldus, in 1541, with the doſes of each. The Jeſuit Dandini, who went to Mount Libanus in quality of the pope's nuncio, ordained, in a ſynod held there in 1596, that chriſm for the future ſhould be made only of two ingredients, oil and balſam; the one repreſenting the human nature of Jeſus Chriſt, the other his divine nature. The action of impoſing the chriſm is called *chriſmation*: this the generality of the Romiſh divines hold to be the next matter of the ſacrament of confirmation.

The chriſmation in baptiſm is performed by the prieſt; that in confirmation by the biſhop: that in ordination, &c. is more uſually ſtyled *unction*.

Chrism Pence, *Chrismatis Denarii*, or *Chrismales Denarii*, a tribute anciently paid to the biſhop by the pariſh clergy, for their chriſm, conſecrated at Eaſter for the enſuing year: this was afterwards condemned as ſimoniacal.

CHRISOM, a white garment put upon a child by the prieſt immediately after baptiſm, accompanied with this devout prayer; "Take this white veſture as a token of the innocency which, by God's grace in this holy ſacrament of baptiſm, is given unto thee, and for a ſign whereby thou art admoniſhed, ſo long as thou liveſt, to give thyſelf to innocence of living, that after this tranſitory life thou mayeſt be partaker of life everlaſting. Amen."

From this circumſtance the white garment got the name of *chriſom*, which, after being worn a few days, was delivered to the prieſt as a ſacred depoſit, to be produced in future as an evidence againſt the perſon, ſhould he be ſo impious as to renounce his baptiſmal engagements. This ceremony continued in uſe for a conſiderable time after the reformation in the church of England, which required the mother of the child when churched, to offer the chriſom and other cuſtomary oblations. On pronouncing the above mentioned prayer, the prieſt anointed the head of the infant, ſaying, "Almighty God, the father of our Lord Jeſus Chriſt, who hath regenerated thee by water and the Holy Ghoſt, and hath given unto thee the remiſſion of all thy ſins, vouchſafe to anoint thee with the unction of his Holy Spirit, and bring thee to the inheritance of everlaſting life. Amen."

CHRIST, an appellation ſynonymous with *Meſſiah*, uſually added to Jeſus: and, together therewith, denominating the Saviour of the world. See CHRISTIANITY and MESSIAH.

The word χριστος ſignifies *annointed*, from χριω, *inungo*, "I anoint." Sometimes the word *Chriſt* is uſed ſingly,

gly, by way of *antonomaſis*, to denote a perſon ſent from God, as an anointed prophet, king, or prieſt.

Order of Christ, a military order, founded by Dionyſius I. king of Portugal, to animate his nobles againſt the Moors. The arms of this order are gules, patriarchal croſs charged with another croſs argent: they had their reſidence at firſt at Caſtromarin: afterwards they removed to the city of Thomar, as being nearer to the Moors of Andaluſia and Eſtremadura.

Christ is alſo the name of a military order in Livonia, inſtituted in 1205 by Albert biſhop of Riga. The end of this inſtitution was to defend the new Chriſtians who were converted every day in Livonia, but were perſecuted by the heathens. They wore on their cloaks a ſword with a croſs over it, whence they were alſo denominated *brothers of the ſword*.

Christ-Burgh, a town of Poland, near the lake Drauſen, and about three Poliſh miles from Marienburgh.

Christ-Church, a borough town of Hampſhire, 30 miles ſouth-weſt of Wincheſter, near the ſea-coaſt. W. Long. 2. N. Lat. 50. 40. It ſends two members to parliament.

Christ Thorn. See Rhamnus, Botany *Index*.

CHRISTIAN. See Christianity and Christians.

Moſt Christian King, one of the titles of the king of France.

The French antiquarians trace the origin of this appellation up to Gregory the Great, who, writing a letter to Charles Martel, occaſionally gave him that title, which his ſucceſſors have ſince retained.

Christian Religion, that inſtituted by Jeſus Chriſt. See Christianity.

1
Origin of the word.

CHRISTIANITY, the religion of Chriſtians. The word is analogically derived, as other abſtracts from their concretes, from the adjective *Chriſtian*. This again is derived from the name Χριστος, *Chriſtus*, from the word χριω, *I anoint*. Chriſt is called *the anointed*, from a cuſtom which extenſively prevailed in antiquity, and was originally ſaid to be of divine inſtitution, of anointing perſons in the ſacerdotal or regal character, as a public ſignal of their conſecration to their important offices, and as a teſtimony that heaven itſelf was the guarantee of that relation which then commenced between the perſons thus conſecrated and their ſubordinates

2
By what name the apoſtles were firſt diſtinguiſhed.

The diſciples of Jeſus, after the death of their teacher, had for ſome time been called *Nazarenes*, from Nazareth in Galilee, where he dwelt; which afterwards became the deſignation of a particular ſect. They, who adopted the principles and profeſſed the religion which he taught, were firſt diſtinguiſhed by the name of *Chriſtians* at Antioch. That profeſſion, and thoſe doctrines, we now proceed to delineate with as much perſpicuity as the limits of our plan will admit, yet with the conciſeneſs which a work ſo multiform and extenſive requires.

3
Delineation of Chriſtianity.

When a Chriſtian is interrogated concerning the nature and foundation of his faith and practice, his ultimate reference, his laſt appeal, is to the facts, the doctrines, and the injunctions, contained in the books of the Old and New Teſtament. From theſe, therefore, and from theſe alone, muſt every fair account, or the materials of which it is compoſed, be extracted or reduced. Other formularies, or confeſſions of faith, may, according to the Chriſtian, deſerve more or leſs attention, as they are more or leſs immediately contained or implied in the ſcriptures. But whatever is not actually expreſſed in, or reduced by fair and neceſſary conſequence from, theſe writings, muſt be regarded as merely human; and can have no other title to our aſſent and obſervation than what they derive from their conformity with the ſcriptures, with the dictates and feelings of a reformed and cultivated mind, or with thoſe meaſures which are found expedient and uſeful in human life. But as thoſe books, from whence the Chriſtian inveſtigates his principles of belief and rules of conduct, have been variouſly interpreted by different profeſſors and commentators, theſe diverſities have given birth to a multiplicity of different ſects. It cannot, therefore, be expected, that any one who undertakes to give an account of Chriſtianity, ſhould comprehend all the writings and opinions which have been propagated and exhibited by hiſtorical, ſyſtematical, or polemical authors. Theſe, if at all contained in ſuch a work as this, ſhould be ranged under their proper articles, whether ſcientifical, controverſial, or biographical. It is our preſent buſineſs, if poſſible, to confine ourſelves to a detail of ſuch facts and doctrines as, in the ſtrict and primitive ſenſe of the word, are *catholic*, or, in other expreſſions, to ſuch as uniformly have been, and ſtill are, recognized and admitted by the whole body of Chriſtians.

4
Account of Chriſtianity whence deducible.

We have already ſaid that theſe, or at leaſt the greateſt number of them, appeal to the ſcriptures of the Old and New Teſtament as the ultimate ſtandard, the only infallible rule of faith and manners. If you aſk them, by what authority theſe books claim an abſolute right to determine the conſciences and underſtandings of men with regard to what they ſhould believe and what they ſhould do? They will anſwer you, that all ſcripture, whether for doctrine, correction, or reproof, was given by immediate inſpiration from God.

5
The nature of its evidences.

If again you interrogate them how thoſe books, which they call *Scripture*, are authenticated? they reply, that the evidences by which the Old and New Teſtament are proved to be the Word of God, are either external or internal. The *external* may again be divided into direct or collateral. The direct evidences are ſuch as ariſe from the nature, conſiſtency, and probability, of the facts; and from the ſimplicity, uniformity, competency, and fidelity, of the teſtimonies by which they are ſupported. The collateral events are either the ſame occurrences ſupported by Heathen teſtimonies, or others which concur with and corroborate the hiſtory of Chriſtianity. Its *internal* evidence ariſes either from its exact conformity with the character of God, from its aptitude to the frame and circumſtances of man, or from thoſe ſupernatural convictions and aſſiſtances which are impreſſed on the mind by the immediate operation of the divine Spirit. Theſe can only be mentioned in a curſory manner in a detail ſo conciſe as the preſent.

6
How Chriſtianity is ſupported by facts.

Such facts as are related in the hiſtory of his religion, the Chriſtian aſſerts to be not only conſiſtent each with itſelf, but likewiſe one with another. Hence it is, that, by a ſeries of antecedents and conſequences, they corroborate each other, and form a chain which cannot be broken but by an abſolute ſubverſion of all hiſtorical authenticity. Nor is this all: for, according to him, the facts on which Chriſtianity is founded, not only conſtitute a ſeries of themſelves, but are likewiſe in ſeveral periods the beſt reſources for ſupplying the chaſms in the hiſtory of our nature, and preſerving the tenor of its annals entire. The facts themſelves are either natural or ſupernatural. By natural facts we mean ſuch occurrences as happen or may happen from the various operations of mechanical powers, or from the interpoſition of natural agents without higher aſſiſtants. Such are all the common occurrences of hiſtory, whether natural, biographical, or civil. By ſupernatural facts, we mean ſuch as could not have been produced without the interpoſition of Deity, or at leaſt of powers ſuperior to the laws of mechaniſm or the agency of embodied ſpirits. Among theſe may be reckoned the immediate change of water into wine, the inſtantaneous cure of diſeaſes without the intervention of medicine, the reſuſcitation of the dead, and others of the ſame kind. In this order of occurrences may likewiſe be numbered the exertions and exhibitions of prophetic power, where the perſons by whom theſe extraordinary talents were diſplayed could neither by penetration nor conjecture unravel the mazes of futurity, and trace the events of which they ſpoke from their primary cauſes to their remote completions. So that they muſt have been the paſſive organs of ſome ſuperior Being, to whom the whole concatenation of cauſes and effects which operate from the origin to the conſummation of nature, was obvious at a glance of thought.

7
Natural facts, what, and how conducive to the elucidation of hiſtory.

It has already been hinted, that the facts which we have called *natural*, not only agree with the analogy of human events, and corroborate each other, but in a great many emergencies nobly illuſtrate the hiſtory of nature in general. For this a Chriſtian might offer one inſtance, of which philoſophy will not perhaps be able to produce any tolerable ſolution, without having recourſe to the facts upon which Chriſtianity is founded. For if mankind were originally deſcended from one pair alone, how ſhould it have happened that long before the date of authentic hiſtory every nation had its own diſtinct language? Or, if it be ſuppoſed, as ſome late philoſophers have maintained, that man is an indigenous animal in every country; or, that he was originally produced in, and created for, each particular ſoil and climate which he inhabits; ſtill it may be demanded, whence the prodigious multiplicity, the immenſe diverſity of languages? Is the language of every nation intuitive, or were they dictated by exigences, and eſtabliſhed by convention? If the laſt of theſe ſuppoſitions be true, what an immenſe period of time muſt have paſſed! How many revolutions of material and intellectual nature muſt have happened! What acceſſions of knowledge, refinement, civilization, muſt human intercourſe have gained before the formation and eſtabliſhment even of the moſt ſimple, imperfect, and barbarous language! Why is a period ſo vaſt obliterated ſo entirely as to eſcape the retroſpect of hiſtory, or tradition, and even of fable itſelf? Why was the acquiſition and improvement of other arts ſo infinitely diſtant from that of language, that the era of the latter is entirely loſt, whilſt we can trace the former from their origin through the various gradations of their progreſs.

8
This obſcurity inexplicable but by the Moſaic account.

Theſe difficulties, inextricable by all the lights of hiſtory or philoſophy, this more than Cimmerian darkneſs, is immediately diſſipated by the Moſaic account of the confuſion of tongues; wiſely intended to ſeparate the tribes of men one from another, to repleniſh the ſurface of the globe, and to give its multiplied inhabitants thoſe opportunities of improvement which might be derived from experiment and induſtry, variouſly exerted, according to the different ſituations in which they were placed, and the different employments which theſe ſituations dictated. Thus the time of nature's exiſtence is limited to a period within the ken of human intellect. Thus whatever has happened might have happened during the preſent mode of things; whereas, if we deduce the origin and diverſity of language from a period ſo remotely diſtant as to be abſolutely loſt, and entirely detached from all the known occurrences and viciſſitudes of time, we muſt admit the preſent forms and arrangements of things to have ſubſiſted perhaps for a much longer duration than any mechanical philoſopher will allow to be poſſible. Other inſtances equally pregnant with conviction might be multiplied; but precluded by the limits of our plan, we proceed to a ſingle obſervation upon the facts which have been termed *ſupernatural*.

9
Miracles, how conducive to prove the truth of Chriſtianity.

Of thoſe changes which happen in ſenſible objects, ſenſation alone can be judge. Reaſon has nothing to do in the matter. She may draw concluſions from the teſtimonies of ſenſe, but can never refute them. If, therefore, our ſenſes inform us that ſnow is white, in vain would the moſt learned and ſubtile philoſopher endeavour to convince us, that it was of a contrary colour. He might confound, but never could perſuade us. Such changes, therefore, as appear to happen in ſenſible objects, muſt either be real or fallacious. If real, the miracle is admitted; if fallacious, there muſt be a cauſe of deception equally unaccountable from the powers of nature, and therefore equally miraculous. If the veracity or competency of the witneſſes be queſtioned, the Chriſtian anſwers, that they muſt be competent, becauſe the facts which they relate are not beyond their capacity to determine. They muſt likewiſe be faithful, becauſe they had no ſecular motives for maintaining, but many for ſuppreſſing or diſguiſing, what they teſtified. Now the Chriſtian appeals to the whole ſeries of hiſtory and experience, whether ſuch a man is or can be found, as will offer a voluntary, ſolemn, and deliberate ſacrifice of truth at the ſhrine of caprice. But ſuch facts as after a long continuance of time have been found exactly agreeable to predictions formerly emitted, muſt ſuperſede the fidelity of teſtimony, and infallibly prove that the event was known to the Being by whom it was foretold. In vain has it been urged, that prophecies are ambiguous and equivocal. For though they may prefigure ſubordinate events, yet if the grand occurrences to which they ultimately relate, can alone fulfil them in their various circumſtances, and in their utmoſt extent, it is plain, that the Being by whom they were revealed muſt have been actually preſcient of thoſe events, and muſt have had them in view when the predictions were uttered. For this ſee a learned and

10
Prophecy evident by its own nature independent of its vehicles.

and ingenious Diſſertation on the Credibility of Goſpel-hiſtory, by Dr M'Knight; where the evidences urged by the Chriſtian in defence of his tenets, which appear detached and ſcattered through innumerable volumes, are aſſembled and arranged in ſuch a manner as to derive ſtrength and luſtre from the method in which they are diſpoſed, without diminiſhing the force of each in particular. See alſo the works of Dr Hurd: conſult likewiſe thoſe of Newton, Sherlock, Chandler, &c. For the evidences of thoſe preternatural facts which have been termed *miracles*, the reader may peruſe a ſhort but elegant and concluſive defence of theſe aſtoniſhing phenomena, in anſwer to Mr Hume, by the Rev. George Campbell, D. D.

11 Properties common to all religions. It muſt be obvious to every reflecting mind, that whether we attempt to form the idea of any religion *à priori*, or contemplate thoſe which have been already exhibited, certain facts, principles, or *data*, muſt be preeſtabliſhed, from whence will reſult a particular frame of mind and courſe of action ſuitable to the character and dignity of that being by whom the religion is enjoined, and adapted to the nature and ſituation of thoſe agents who are commanded to obſerve it. Hence *Chriſtianity* may be divided into *credenda* or doctrines, and *agenda* or precepts.

12 Chriſtian theology. As the great foundation of his religion, therefore, the Chriſtian believes the exiſtence and government of one eternal and infinite Eſſence, which for ever retains in itſelf the cauſe of its own exiſtence, and inherently poſſeſſes all thoſe perfections which are compatible with its nature; ſuch are, its almighty power, omniſcient wiſdom, infinite juſtice, boundleſs goodneſs, and univerſal preſence. In this indiviſible eſſence the Chriſtian recogniſes three diſtinct ſubſiſtences, yet diſtinguiſhed in ſuch a manner as not to be incompatible with eſſential unity or ſimplicity of being. Nor is their eſſential union incompatible with their perſonal diſtinction. Each of them poſſeſſes the ſame nature and properties to the ſame extent. As, therefore, they are conſtituents of one God, if we may uſe the expreſſion, there is none of them ſubordinate, none ſupreme. The only way by which the Chriſtian can diſcriminate them is, by their various relations, properties, and offices. Thus the Father is ſaid eternally to beget the Son, the Son to be eternally begotten of the Father, and the Holy Ghoſt eternally to proceed from both.

This infinite Being, though abſolutely independent and for ever ſufficient for his own beatitude, was graciouſly pleaſed to create an univerſe replete with inferior intelligences, who might for ever contemplate and enjoy his glory, participate his happineſs, and imitate his perfections. But as freedom of will is eſſential to the nature of moral agents, that they may cooperate with God in their own improvement and happineſs, ſo their natures and powers are neceſſarily limited, and by that conſtitution rendered peccable. This degeneracy firſt took place in a rank of intelligence ſuperior to man. But guilt is never ſtationary. Impatient in itſelf, and curſed with its own feelings, it proceeds from bad to worſe, whilſt the poignancy of its torments increaſes with the number of its perpetrations. Such was the ſituation of Satan and his apoſtate angels. They attempted to transfer their turpitude and miſery to man; and were, alas! but too ſucceſsful. Hence the heterogeneous and irreconcileable principles which operate in his nature. Hence that inexplicable medley of wiſdom and folly, of rectitude and error, of benevolence and malignity, of ſincerity and fraud, exhibited though his whole conduct. Hence the darkneſs of his underſtanding, the depravity of his will, the pollution of his heart, the irregularity of his affections, and the abſolute ſubverſion of his whole internal economy. Theſe ſeeds of perdition ſoon ripened into overt acts of guilt and horror. All the hoſtilities of nature were confronted, and the whole ſublunary creation became a theatre of diſorder and miſchief.

Here the Chriſtian once more appeals to fact and experience. If theſe things are ſo; if *man* is the veſſel of guilt and the victim of miſery; he demands how this conſtitution of things can be accounted for? how can it be ſuppoſed, that a being ſo wicked and unhappy ſhould be the production of an infinitely perfect Creator? He therefore inſiſts, that human nature muſt have been diſarranged and contaminated by ſome violent ſhock; and that, of conſequence, without the light diffuſed over the face of things by Chriſtianity, all nature muſt remain an inſcrutable and inexplicable myſtery.

To redreſs theſe evils, to re eſtabliſh the empire of virtue and happineſs, to reſtore the nature of man to its primitive rectitude, to ſatisfy the remonſtrances of infinite juſtice, to purify every original or contracted ſtain, to expiate the guilt and deſtroy the power of vice, the eternal Son of God, the ſecond Perſon of the ſacred Trinity, the Logos or Divine Word, the Redeemer or Saviour of the world, the Immanuel or God with us, from whom Chriſtianity takes its name, and to whom it owes its origin, deſcended from the boſom of his Father; aſſumed the human nature; became the repreſentative of man; endured a ſevere probation in that character; exhibited a pattern of perfect righteouſneſs; and at laſt ratified his doctrine, and fully accompliſhed all the ends of his miſſion, by a cruel, unmerited, and ignominious death. Before he left this world, he delivered the doctrine of human ſalvation, and the rules of human conduct, to his apoſtles, whom he empowered to inſtruct the world in all that concerns their eternal felicity, and whom he inveſted with miraculous gifts to aſcertain the reality of what they taught. To them he likewiſe promiſed another comforter, even the Divine Spirit, who ſhould relume the darkneſs, conſole the woes, and purify the ſtains, of human nature. Having remained for a part of three days under the power of death, he roſe again from the grave, diſcovered himſelf to his diſciples, converſed with them for ſome time, then aſcended to heaven; from whence the Chriſtian expects him, according to his promiſe, to appear as the Sovereign Judge of the living and the dead, from whoſe awards there is no appeal, and by whoſe ſentence the deſtiny of the pious and the wicked ſhall be eternally fixed.

Soon after his departure to the right hand of his Father, where, in his human nature, he ſits ſupreme of all created beings, and inveſted with the abſolute adminiſtration of heaven and earth, the Spirit of grace and conſolation deſcended on his apoſtles with viſible ſignatures of divine power and preſence. Nor were his ſalutary operations confined to them, but extended to all the rational world, who did not by obſtinate guilt repel his influence, and provoke him to withdraw them. Theſe, indeed, were leſs conſpicuous than at the glorious era when they were viſibly exhibited in the perſons of the apoſtles; but though his energy is leſs obſervable, it is by no means leſs effectual to all the purpoſes of grace and mercy.

The Chriſtian is convinced, that there is and ſhall continue to be a ſociety upon earth, who worſhip God as revealed in Jeſus Chriſt; who believe his doctrines; who obſerve his precepts; and who ſhall be ſaved by his death, and by the uſe of theſe external means of ſalvation which he hath appointed.

13
The external means of Chriſtianity, what, and how promotive of their end.

Theſe are few and ſimple. The ſacraments of baptiſm and the euchariſt, the interpretation and application of ſcripture, the habitual exerciſe of public and private devotion, are obviouſly calculated to diffuſe and promote the intereſts of truth and virtue, by ſuperinducing the ſalutary habits of faith, love, and repentance.

The Chriſtian is firmly perſuaded, that at the conſummation of things, when the purpoſes of providence in the various revolutions of progreſſive nature are accompliſhed, the whole human race ſhall once more iſſue from their graves; ſome to immortal felicity, from the actual perception and enjoyment of their Creator's preſence; others to everlaſting ſhame and miſery.

It is worthy of obſervation, that all who profeſs to believe the Chriſtian ſyſtem, do not ſubſcribe to the truth of everlaſting miſery. They conceive it impoſſible that a good and merciful being could create innumerable intelligences with a view to make them eternally wretched, elſe they apprehend that exiſtence would be a curſe and not a bleſſing; and that although man, by being created free, becomes amenable to God for his conduct, yet they contend that this God muſt have ſeen from eternity what uſe man would make of his free agency, and have deviſed the moſt effectual means for counteracting the evils reſulting from moral depravity, and reſolved to bring final and eternal good out of all the evil which now does, or which in future may exiſt. Finally, they deny that any epithet applied to the miſeries of a future ſtate denotes duration without end, and they aſſert that all the judgments inflicted on nations and individuals here upon earth, are manifeſtly the chaſtiſements of a father for the recovery of delinquents, in which light they alſo conſider the puniſhments to be inflicted in the world to come. It is our province to give a candid ſtatement of both ſides of a queſtion, leaving it to our readers to form a judgment for themſelves.

14
Chriſtian morality.

The two grand principles of action, according to the Chriſtian, are, The love of God, which is the ſovereign paſſion in every perfect mind; and the love of man, which regulates our actions according to the various relations in which we ſtand, whether to communities or individuals. This ſacred connection can never be totally extinguiſhed by any temporary injury. It ought to ſubſiſt in ſome degree even amongſt enemies. It requires that we ſhould pardon the offences of others, as we expect pardon for our own; and that we ſhould no farther reſiſt evil than is neceſſary for the preſervation of perſonal rights and ſocial happineſs. It dictates every relative and reciprocal duty between parents and children, maſters and ſervants, governors and ſubjects, friends and friends, men and men. Nor does it merely enjoin the obſervation of equity, but likewiſe inſpires the moſt ſublime and extenſive charity, a boundleſs and diſintereſted effuſion of tenderneſs for the whole ſpecies, which feels their diſtreſs and operates for their relief and improvement. Theſe celeſtial diſpoſitions, and the different duties which are their natural exertions, are the various gradations by which the Chriſtian hopes to attain the perfection of his nature and the moſt exquiſite happineſs of which it is ſuſceptible.

15
This ſyſtem aſſerted by the Chriſtian, ſuperior in the excellence of its nature, and the evidence of its reality, to all others.

Such are the ſpeculative, and ſuch the practical principles of Chriſtianity. From the former, its votaries contend, that the origin, economy, and revolutions of intelligent nature alone can be rationally explained. From the latter they aſſert, that the nature of man, whether conſidered in its individual or ſocial capacity, can alone be conducted to its higheſt perfection and happineſs. With the determined Atheiſts they ſcarcely deign to expoſtulate. For, according to them, philoſophers who can deduce the origin and conſtitution of things from caſual rencounters or mechanical neceſſity, are capable of deducing any concluſion from any premiſes. Nor can a more glaring inſtance of abſurdity be produced, than the idea of a contingent or ſelf-originated univerſe. When Deiſts and other ſectarians upbraid them with myſterious or incompatible principles, they without heſitation remit ſuch cavillers to the creed of natural religion. They demand why any reaſoner ſhould refuſe to believe three diſtinct ſubſtances in one indiviſible eſſence, who admits that a being may be omnipreſent without extenſion; or that he can impreſs motion upon other things, whilſt he himſelf is neceſſarily immoveable. They aſk the ſage, why it ſhould be thought more extraordinary, that the Son of God ſhould be ſent to this world, that he ſhould unite the human nature to his own, that he ſhould ſuffer and die for the relief of his degenerate creatures, than that an exiſtence whoſe felicity is eternal, inherent, and infinite, ſhould have any motive for creating beings exterior to himſelf? Is it not, ſays the Chriſtian, equally worthy of the divine interpoſition to reſtore order and happineſs where they are loſt, as to communicate them where they never have been? Is not infinite goodneſs equally conſpicuous in relieving miſery as in diffuſing happineſs? Is not the exiſtence of what we call evil in the world, under the tuition of an infinitely perfect Being, as inſcrutable as the means exhibited by Chriſtianity for its abolition? Vicarious puniſhment, imputed guilt and righteouſneſs, merit or demerit transferred, are certainly not leſs reconcileable to human reaſon, *à priori*, than the exiſtence of vice and puniſhment in the productions of infinite wiſdom, power, and goodneſs: particularly when it is conſidered, that the virtues exerted and diſplayed by a perfect Being in a ſtate of humiliation and ſuffering, muſt be meritorious, and may therefore be rewarded by the reſtored felicity of inferior creatures in proportion to their glory and excellence; and that ſuch merit may apply the bleſſings which it has deſerved, in whatever manner, in whatever degree, and to whomſoever it pleaſes, without being under any neceſſity to violate the freedom of moral agents, in recalling them to the path of virtue and happineſs by a mechanical and irreſiſtible force.

16
Miraculous as poſſible, and perhaps as neceſſary, as natural events.

It will be granted to philoſophy by the Chriſtian, that as no theory of mechanical nature can be formed without preſuppoſing ſacred and eſtabliſhed laws from which ſhe ought rarely if ever to deviate, ſo in fact ſhe tenaciouſly purſues theſe general inſtitutions, and from their conſtant obſervance reſult the order and regularity of things. But he cannot admit, that the important ends of moral and intellectual improvement may be uniformly obtained by the ſame means. He affirms, that if the hand of God ſhould either remain always entirely inviſible, or at leaſt only perceptible in the operation of ſecond cauſes, intelligent beings would be apt in the courſe of time to reſolve the interpoſitions of Deity into the general laws of mechaniſm; to forget his connection with nature, and conſequently their dependence upon him. Hence, according to the dictates of common ſenſe, and to the unanimous voice of every religion in every age or clime, for the purpoſes of wiſdom and benevolence, God may not only controul, but has actually controuled, the common courſe and general operations of nature. So that, as in the material world the law of *cauſe* and *effect* is generally and ſcrupulouſly obſerved for the purpoſes of natural ſubſiſtence and accommodation: thus ſuſpenſes and changes of that univerſal law are equally neceſſary for the advancement of moral and intellectual perfection.

17
Chriſtianity not only explains the phenomena, but conſoles the miſeries of human nature.

But the diſciple of Jeſus not only contends, that no ſyſtem of religion has ever yet been exhibited ſo conſiſtent with itſelf, ſo congruous to philoſophy and the common ſenſe of mankind, as Chriſtianity; he likewiſe avers that it is infinitely more productive of real and ſenſible conſolation than any other religious or philoſophical tenets, which have ever entered into the ſoul, or been applied to the heart of man. For what is death to that mind which conſiders eternity as the career of its exiſtence? What are the frowns of fortune to him who claims an eternal world as his inheritance? What is the loſs of friends to that heart which feels, with more than natural conviction, that it ſhall quickly rejoin them in a more tender, intimate, and permanent intercourſe than any of which the preſent life is ſuſceptible? What are the fluctuations and viciſſitudes of external things to a mind which ſtrongly and uniformly anticipates a ſtate of endleſs and immutable felicity? What are mortifications, diſappointments, and inſults, to a ſpirit which is conſcious of being the original offſpring and adopted child of God; which knows that its omnipotent Father will, in proper time, effectually aſſert the dignity and privileges of its nature? In a word, as earth is but a ſpeck of creation, as time is not an inſtant in proportion to eternity, ſuch are the hopes and proſpects of the Chriſtian in compariſon of every ſublunary misfortune or difficulty. It is therefore, in his judgment, the eternal wonder of angels, and indelible opprobrium of man, that a religion ſo worthy of God, ſo ſuitable to the frame and circumſtances of our nature, ſo conſonant to all the dictates of reaſon, ſo friendly to the dignity and improvement of intelligent beings, pregnant with genuine comfort and delight, ſhould be rejected and deſpiſed. Were there a poſſibility of ſuſpence or heſitation between this and any other religion extant, he could freely truſt the determination of a queſtion ſo important to the candid deciſion of real virtue and impartial philoſophy.

It muſt be allowed that the utmoſt extent of human inveſtigation and reſearch into the doctrine of a future life, reached no farther than ſplendid conjecture before the promulgation of Chriſtianity, at which period life and immortality were clearly brought to light. It is therefore a ſingular circumſtance that the deiſt ſhould not perceive the wonderful ſuperiority of the Chriſtian over every other ſyſtem, if it had nothing elſe to boaſt of but this ſingle doctrine, ſo pregnant with unalloyed felicity. If Chriſtianity be falſe, the believer of it has nothing to loſe, ſince it inculcates a mode of conduct which muſt ever be amiable in the eye of infinite goodneſs; but if it be true, he has every thing to gain: while upon this hypotheſis the deiſt has every thing to loſe and nothing to gain. This is a momentous conſideration, and that man muſt be truly infatuated who can treat ſuch an idea with contempt.

18
Mr Gibbon attempts to prove, that the propagation of Chriſtianity was owing to cauſes from the operation of which no arguments can be deduced in proof of its authenticity.

Mr Gibbon, in his Hiſtory of the Decline and Fall of the Roman Empire, mentions five ſecondary cauſes to which he thinks the propagation of Chriſtianity, and all the remarkable circumſtances which attended it, may with good reaſon be aſcribed. He ſeems to inſinuate, that Divine Providence did not act in a ſingular or extraordinary manner in diſſeminating the religion of Jeſus through the world; and that, if every other argument which has been adduced to prove the ſacred authority of this religion can be parried or refuted, nothing can be deduced from this ſource to prevent it from ſharing the ſame fate with other ſyſtems of ſuperſtition. The cauſes of its propagation were in his opinion founded on the principles of human nature and the circumſtances of ſociety. If we aſcribe not the propagation of Mahometiſm, or of the doctrines of Zerduſt, to an extraordinary interpoſition of Divine Providence, operating by an unperceived influence on the diſpoſitions of the human heart, and controuling and confounding the ordinary laws of nature; neither can we, upon any reaſonable grounds, refer the promulgation of Chriſtianity to ſuch an interpoſition.

19
The cauſes.

The ſecondary cauſes to which he aſcribes theſe effects are, 1. The inflexible and intolerant zeal of the Chriſtians; derived from the Jewiſh religion, but purified from the narrow and unſocial ſpirit which, inſtead of inviting, deterred the Gentiles from embracing the law of Moſes. 2. The doctrine of a future life improved by every additional circumſtance which could give weight and efficacy to that important truth. 3. The miraculous powers aſcribed to the primitive church. 4. The pure and auſtere morals of the Chriſtians. 5. The union and diſcipline of the Chriſtian republic, which gradually formed an independent and increaſing ſtate in the heart of the Roman empire.

Before we enter on the examination of Mr Gibbon's cauſes in the order in which they are here enumerated, we beg leave to remark, that we cannot perceive the propriety of denominating ſome of theſe *ſecondary* cauſes, ſince the miraculous powers aſcribed to the primitive church, if they were real, muſt have conſtituted a primary cauſe, and if fallacious, could have been no cauſe at all, if not of its complete ſubverſion. As little can we conceive how ſuch an elegant and learned author could imagine a zeal ſtrictly and properly inflexible and intolerant, as qualified to produce any other effect than the deſtruction of the ſyſtem which they are allowed to have been anxious to promote. But our ſentiment of theſe cauſes aſſigned by Mr Gibbon will be more fully developed as we proceed in our candid and impartial examination of them.

20 Cauſe I.

In pointing out the connection between the *firſt* of theſe cauſes and the effects which he repreſents as ariſing from it, this learned and ingenious writer obſerves, that the religion of the Jews does not ſeem to have been intended to be propagated among the Heathens, and that the converſion of proſelytes was rather accidental than conſiſtent with the purport of the general ſpirt of the inſtitutions of Judaiſm. The Jews were, of conſequence, ſtudious to preſerve themſelves a peculiar people. Their zeal for their own religion was intolerant, narrow, and unſocial.

In Chriſtianity, when it made its appearance in the world, all the better part of the predominant ſpirit of Judaiſm was retained; but whatever might have a tendency to confine its influence within narrow limits was laid aſide. Chriſtians were to maintain the doctrines and adhere to the inſtitutions of their religion with ſacred fidelity. They were not to violate their allegiance to Jeſus by entertaining or profeſſing any reverence for Jupiter or any other of the Heathen deities; it was not even neceſſary for them to comply with the poſitive and ceremonial inſtitutions of the law of Moſes,—although theſe were acknowledged to have been of divine origin. The zeal, therefore, which their religion inculcated, was inflexible. It was even intolerant: for they were not to content themſelves with profeſſing Chriſtianity and conforming to its laws; they were to labour with unremitting aſſiduity, and to expoſe themſelves to every difficulty and every danger, in converting others to the ſame faith.

But the ſame circumſtances which rendered it thus intolerant, communicated to it a more liberal and a leſs unſocial ſpirit than that of Judaiſm. The religion of the Jews was intended only for the few tribes; Chriſtianity was to become a catholic religion; its advantages were to be offered to all mankind.

All the different ſects which aroſe among the primitive Chriſtians uniformly maintained the ſame zeal for the propagation of their own religion, and the ſame abhorrence for every other. The orthodox, the Ebionites, the Gnoſtics, were all equally animated with the ſame excluſive zeal, and the ſame abhorrence of idolatry, which had diſtinguiſhed the Jews from other nations.

21 Obſervations in anſwer.

Such is the general purport of what Mr Gibbon advances concerning the influence of the firſt of thoſe ſecondary cauſes in the propagation of Chriſtianity. It would be uncandid to deny, that his ſtatement of facts appears to be, in this inſtance, almoſt fair, and his deductions tolerably logical. The firſt Chriſtians *were* remarkable for their deteſtation of idolatry, and for the generous diſintereſted zeal with which they laboured to convert others to the ſame faith. The firſt of theſe principles, no doubt, contributed to maintain the dignity and purity of Chriſtianity; and the ſecond to diſſeminate it through the world. But the facts which he relates are ſcarce conſiſtent throughout. He ſeems to repreſent the zeal of the firſt Chriſtians as ſo hot and intolerant, that they could have no ſocial intercourſe with thoſe who ſtill adhere to the worſhip of Heathen deities. In this caſe, how could they propagate their religion? Nay, we may even aſk, How could they live? If they could not mingle with the Heathens in the tranſactions either of peace or war; nor witneſs the marriage or the funeral of the deareſt friend, if a Heathen; nor practiſe the elegant arts of muſic, painting, eloquence, or poetry; nor venture to uſe freely in converſation the language of Greece or of Rome;—it is not eaſy to ſee what opportunities they could have of diſſeminating their religious ſentiments. If, in ſuch circumſtances, and obſerving rigidly ſuch a tenor of conduct, they were yet able to propagate their religion with ſuch amazing ſucceſs as they are ſaid to have done; they muſt ſurely either have practiſed ſome wondrous arts unknown to us, or have been aſſiſted by the ſupernatural operation of divine power.

But all the hiſtorical records of that period, whether ſacred or profane, concur to prove, that the primitive Chriſtians in general did not retire with ſuch religious horror from all intercourſe with the Heathens. They refuſed not to ſerve in the armies of the Roman empire: they appealed to Heathen magiſtrates, and ſubmitted reſpectfully to their deciſion; the huſband was often a Heathen, and the wife a Chriſtian; or, again, the huſband a Chriſtian, and the wife a Heathen. Theſe are facts ſo univerſally known and believed, that we need not quote authorities in proof of them.

This reſpectable writer appears therefore not to have ſtated the facts which he produces under this head with ſufficient ingenuouſneſs; and he has taken care to exaggerate and improve thoſe which he thinks uſeful to his purpoſe with all the dazzling, deluſive colours of eloquence. But had the zeal of the firſt Chriſtians been ſo intolerant as he repreſents it, it muſt have been highly unfavourable to the propagation of their religion: all their wiſhes to make converts would, in that caſe, have been counteracted by their unwillingneſs to mix, in the ordinary intercourſe of life, with thoſe who were to be converted. Their zeal, and the liberal ſpirit of their religion, were indeed ſecondary cauſes which contributed to its propagation: but their zeal was by no means ſo ridiculouſly intolerant as this writer would have us believe; if it had, it muſt have produced effects directly oppoſite to thoſe which he aſcribes to it.

22 Cauſe II.

In illuſtrating the influence of the *ſecond* of theſe ſecondary cauſes to which he aſcribes the propagation of Chriſtianity, Mr Gibbon diſplays no leſs ingenuity than in tracing the nature and the effects of the firſt. The doctrine of a future life, improved by every additional circumſtance which can give weight and efficacy to that important truth, makes a conſpicuous figure in the Chriſtian ſyſtem; and it is a doctrine highly flattering to the natural hopes and wiſhes of the human heart.

Though the Heathen philoſophers were not unacquainted with this doctrine; yet to them the ſpirituality of the human ſoul, its capacity of exiſtence in a ſeparate ſtate from the body, its immortality, and its proſpect of laſting happineſs in a future life, rather appeared things poſſible and deſirable, than truths fully eſtabliſhed upon ſolid grounds. Theſe doctrines, Mr Gibbon would perſuade us, had no influence on the moral ſentiments and general conduct of the Heathens. Even the philoſophers, who amuſed themſelves with diſplaying their eloquence and ingenuity on thoſe ſplendid themes, did not allow them to influence the tenor of their lives. The great body of the people, who were occupied in purſuits very different from the ſpeculations of philoſophy, and were unacquainted with the queſtions diſcuſſed in the ſchools, were ſcarce ever at pains to reflect whether they conſiſted of a material and a ſpiritual part, or whether their exiſtence was to be prolonged beyond the term of the preſent life; and they could not regulate their lives by principles which they did not know.

In the popular ſuperſtition of the Greeks and Romans, the doctrine of a future ſtate was not omitted. Mankind were not only flattered with the hopes of continuing to exiſt beyond the term of the preſent life; but different conditions of exiſtence were promiſed or threatened, in which retributions for their conduct in human life were to be enjoyed or ſuffered. Some were exalted to heaven, and aſſociated with the gods; others were rewarded with leſs illuſtrious honours, and a more moderate ſtate of happineſs, in Elyſium; and thoſe, again, who by their conduct in life had not merited rewards, but puniſhments, were conſigned to Tartarus. Such were the ideas of a future ſtate which made a part of the popular ſuperſtition of the Greeks and Romans. But they produced only a very faint impreſſion on the minds of thoſe among whom they prevailed. They were not truths ſupported by evidence; they were not even plauſible; they were a tiſſue of abſurdities. They had not therefore a more powerful influence on the morals, than the more refined ſpeculations of the philoſophers.

Even the Jews, whoſe religion and legiſlature were communicated from heaven, were in general, till within a very ſhort time before the propagation of the goſpel, as imperfectly acquainted with the doctrine of a future ſtate as the Greeks and Romans. This doctrine made no part of the law of Moſes. It is but darkly and doubtfully inſinuated through the other parts of the Old Teſtament. Thoſe among the Jews who treated the ſacred Scriptures with the higheſt reverence, always denied that ſuch a doctrine could be deduced from any thing which theſe taught; and maintained that death is the final diſſolution of man.

The rude tribes who inhabited ancient Gaul, and ſome other nations not more civilized than they, entertained ideas of a future life, much clearer than thoſe of the Greeks, the Romans, or the Jews.

Chriſtianity, however, explained and inculcated the truth of this doctrine in all its ſplendour and all its dignity. It exhibited an alluring, yet not abſurd, view of the happineſs of a future life. It conferred new horrors on the place of puniſhment, and added new ſeverity to the tortures to be inflicted, in another world. The authority on which it taught theſe doctrines, and diſplayed theſe views, was ſuch as to ſilence inquiry and doubt, and to command implicit belief. What added to the influence of the doctrine of a future ſtate of exiſtence, thus explained and inculcated, was, that the firſt Chriſtians confidently propheſied and ſincerely believed that the end of the world, the conſummation of all things, was faſt approaching, and that the generation then preſent ſhould live to witneſs that awful event. Another circumſtance which contributed to render the ſame doctrine ſo favourable to the propagation of Chriſtianity was, that the firſt Chriſtians dealt damnation without remorſe, and almoſt without making any exceptions, on all who died in the belief of the abſurdities of Heathen ſuperſtition. Thus taught and improved with theſe additional and heightened circumſtances, this doctrine, partly by preſenting alluring proſpects and exciting pleaſing hopes, partly by working upon the fears of the human heart with repreſentations of terror, operated in the moſt powerful manner in extending the influence of the Chriſtian faith.

23 Obſervations in anſwer.

Here, too, facts are rather exaggerated, and the inferences ſcarce fairly deduced. It muſt be confeſſed that the ſpeculations of the Heathen philoſophers did not fully and undeniably eſtabliſh the doctrine of the immortality of the human ſoul; nor can we preſume to aſſert, in contradiction to Mr Gibbon, that their arguments could impreſs ſuch a conviction of this truth as might influence in a very ſtrong degree the moral ſentiments and conduct. They muſt, however, have produced ſome influence on theſe. Some of the moſt illuſtrious among the Heathen philoſophers appear to have been ſo ſtrongly impreſſed with the belief of the ſoul's immortality, and of a future ſtate of retribution, that their general conduct was conſtantly and in a high degree influenced by that belief. Plato and Socrates are eminent and well known inſtances. And if, in ſuch inſtances as theſe, the belief of theſe truths produced ſuch conſpicuous effects, it might be fairly inferred, though we had no further evidence, that thoſe characters were far from being ſingular in this reſpect. It is a truth acknowledged as unqeſtionable in the hiſtory of arts and ſciences, that wherever any one perſon has cultivated theſe with extraordinary ſucceſs, ſome among his contemporaries will always be found to have rivalled his excellence, and a number of them to have been engaged in the ſame purſuits. On this occaſion we may venture, without heſitation, to reaſon upon the ſame principles. When the belief of the immortality of the human ſoul produced ſuch illuſtrious patterns of virtue as a Plato and a Socrates, it muſt certainly have influenced the moral ſentiments and conduct of many others, although in an inferior degree. We ſpeculate, we doubt, concerning the truth of many doctrines of Chriſtianity; many who profeſs that they believe them, make this profeſſion only becauſe they have never conſidered ſeriouſly whether they be true or falſe. But, notwithſtanding this, theſe truths ſtill exert a powerful influence on the ſentiments and manners of ſociety in general. Thus, alſo, it appears that the doctrines of ancient philoſophy concerning a future life, and even the notions concerning Olympus, Elyſium, and Tartarus, which made a part of the popular ſuperſtition, *did* produce a certain influence on the ſentiments and manners of the Heathens in general. That influence was often indeed inconſiderable, and not always happy; but ſtill it was ſomewhat greater than Mr Gibbon ſeems willing to allow. Chriſtians have been ſometimes at pains to exaggerate the abſurdities of Pagan ſuperſtition, in order that the advantages of Chriſtianity might acquire new value from being contraſted with it. Here we find one who is rather diſpoſed to be the enemy of Chriſtianity, diſplaying,

ing, and even exaggerating, thoſe abſurdities for a very different purpoſe. But the truth may be ſafely admitted; it is only when exaggerated that it can ſerve any purpoſe inimical to the ſacred authority of our holy religion. Mr Gibbon certainly repreſents the religious doctrine of the ancient Gauls, in reſpect to the immortality of the human ſoul and a future ſtate, in too favourable a light. It is only becauſe the whole ſyſtem of ſuperſtition which prevailed among the barbarians is ſo imperfectly known, that it has been imagined to conſiſt of more ſublime doctrines than thoſe of the popular ſuperſtition of the Greeks and Romans. The evidence which Mr Gibbon adduces in proof of what he aſſerts concerning theſe opinions of the ancient Gauls, is partial, and far from ſatisfactory. They *did* indeeed aſſert and believe the ſoul to be immortal; but this doctrine was blended among a number of abſurdities much groſſer than thoſe which characterize the popular religion of the Greeks and Romans. The latter was the ſuperſtition of a civilized people, among whom reaſon was unfolded and improved by cultivation, and whoſe manners were poliſhed and liberal; the former was that of barbarians, among whom reaſon was, as it were, in its infancy, and who were ſtrangers to the improvements of civilization. When haſty obſervers found that thoſe barbarians were not abſolutely ſtrangers to the idea of immortality, they were moved to undue admiration; their ſurpriſe at finding what they had not expected, confounded their underſtanding, and led them to miſconceive and miſrepreſent. What we ought to aſcribe to the ſavage ferocity of the character of thoſe rude tribes, has been attributed by miſtake to the influence of their belief of a future ſtate.

In the law of Moſes, it muſt be allowed, that this doctrine is not particularly explained nor earneſtly inculcated. The author of the Divine Legation of Moſes, &c. has founded upon this fact an ingenious theory, which we ſhall elſewhere have occaſion to examine. The reaſons why this doctrine was not more fully explained to the Jews, we cannot pretend to aſſign, at leaſt in this place; yet we cannot help thinking, that it was more generally known among the Jews than Mr Gibbon and the author of the Divine Legation are willing to allow. Though it be not ſtrongly inculcated in their *code of laws*, yet there is ſome reaſon to think that it was known and generally prevalent among them long before the Babyloniſh captivity; even in different paſſages in the writings of Moſes, it is mentioned or alluded to in an unequivocal manner. In the hiſtory of the patriarchs, it appears that this doctrine was known to *them*; it appears to have had a ſtrong influence on the mind of Moſes himſelf. Was David, was Solomon, a ſtranger to this doctrine? We cannot here deſcend to very minute particulars; but ſurely all the efforts of ingenuity muſt be inſufficient to torture the ſacred Scriptures of the Old Teſtament, ſo as to prove that they contain nothing concerning the doctrine of a future ſtate any where but in the writings of the later prophets, and that even in theſe it is only darkly inſinuated. Were the Jews, in the earlier part of their hiſtory, ſo totally ſecluded from all intercourſe with other nations, that a doctrine of ſo much importance, more or leſs known to all around, could not be communicated to them? The Phariſees *did* admit traditions, and ſet upon them an undue value; yet they appear to have been conſidered as the moſt orthodox of the different ſects which prevailed among the Jews: the Sadducees were rather regarded as innovators.

But though we are of opinion, that this ingenious writer allows to the doctrine of the Greek and Roman philoſophers, concerning the immortality of the human ſoul, as well as to the notions concerning a future ſtate, which made a part of the popular ſuperſtitions of thoſe nations, leſs influence on the moral ſentiments and conduct of mankind than what they really exerted; though we cannot agree with him in allowing the ideas of the immortality of the ſoul and of a future ſtate, which were entertained by the Gauls and ſome other rude nations, to have been much ſuperior in their nature, or much happier in their influence, than thoſe of the Greeks and Romans; and though, in conſequence of reading the Old Teſtament, we are diſpoſed to think that the Jews knew ſomewhat more concerning the immortality of the human ſoul, and concerning the future ſtate in which human beings are deſtined to exiſt, than Mr Gibbon repreſents them to have known: yet ſtill we are very ſenſible, and very well pleaſed to admit, that "life and immortality were brought to light through the goſpel."

The doctrine of a future life, as it was preached by the firſt Chriſtians, was eſtabliſhed on a more ſolid baſis than that on which it had been before maintained; was freed from every abſurdity; and was, in ſhort, ſo much improved, that its influence, which, as it was explained by Heathen poets and philoſophers, muſt be confeſſed to have been in many inſtances doubtful, now became favourable only to the intereſts of piety and virtue, and to them in a very high degree. It undoubtedly contributed to the ſucceſsful propagation of Chriſtianity; for it was calculated to attract and pleaſe both the ſpeculating philoſopher and the ſimple unenlightened votary of the vulgar ſuperſtition. The views which it exhibited were diſtinct; and all was plauſible and rational, and demonſtrated by the fulleſt evidence. But the happineſs which it promiſed was of a leſs ſenſual nature than the enjoyments which the Heathens expected on Olympus or in Elyſium; and would therefore appear leſs alluring to thoſe who were not very capable of refined ideas, or preferred the gratifications of the ſenſes in the preſent life to every other ſpecies of good. If the firſt Chriſtians rejoiced in the hope of beholding all the votaries of Pagan idolatry afflicted with the torments of hell in a future ſtate, and boaſted of theſe hopes with inhuman exultation, they would in all probability rather irritate than alarm thoſe whom they ſought to convert from that ſuperſtition: the Heathens would be moved to regard with indignant ſcorn the preacher who pretended that thoſe whom they venerated as gods, heroes, and wiſe men, were condemned to a ſtate of unſpeakable and laſting torment. Would not every feeling of the heart revolt againſt the idea, that a parent, a child, a huſband, a wife, a friend, a lover, or a miſtreſs, but lately loſt, and ſtill lamented, was conſigned to eternal torments for actions and opinions which they had deemed highly agreeable to ſuperior powers?

We may conclude, then, with reſpect to the influence of this ſecondary cauſe in promoting the propagation of Chriſtianity, that the circumſtances of the

Chriſtianity.

Heathen world were leſs favourable to that influence than Mr Gibbon pretends; that the means by which he repreſents the primitive Chriſtians, as improving its efficacy, were ſome of them not employed, and others rather likely to weaken than to ſtrengthen it; and that therefore more is attributed to the operation of this cauſe than it could poſſibly produce.

24 Cauſe III.

The *third cauſe*, the miraculous powers of the primitive church, is with good reaſon repreſented as having conduced very often to the conviction of infidels. Mr Gibbon's reaſonings under this head are, That numerous miraculous works of the moſt extraordinary kind were oſtentatiouſly performed by the firſt Chriſtians: that, however, from the difficulty of fixing the period at which miraculous powers ceaſed to be communicated to the Chriſtian church, and from ſome other circumſtances, there is reaſon to ſuſpect them to have been merely the pretences of impoſture; but this (to uſe a phraſe of his own) is only darkly inſinuated: and, laſtly, that the Heathens having been happily prepared to receive them as real by the many wonders nearly of a ſimilar nature to which they were accuſtomed in their former ſuperſtition, the miracles which the firſt Chriſtians employed to give a ſanction to their doctrines, contributed in the moſt effectual manner to the propagation of Chriſtianity.

25 Obſervations in reply.

In reply to what is here advanced, it may be ſuggeſted, that the miracles recorded in the New Teſtament, as having been performed by the firſt Chriſtians when engaged in propagating their religion, as well as a number of others recorded by the Fathers, are eſtabliſhed as true, upon the moſt indubitable evidence which human teſtimony can afford for any fact. Mr Hume, who was too fond of employing his ingenuity in undermining truths generally received, has endeavoured to prove, that no human teſtimony, however ſtrong and unexceptionable, can afford ſufficient evidence of the reality of a miracle. But his reaſonings on this head, which once excited doubt and wonder, have been ſince completely refuted; and mankind ſtill continue to acknowledge, that though we are all liable to miſtakes and capable of deceit, yet human teſtimony *may* afford the moſt convincing evidence of the moſt extraordinary and even ſupernatural facts. The reader will not expect us to enter, in this place, into a particular examination of the miracles of our Saviour and his apoſtles, and the primitive church. An inquiry into theſe will be a capital object in another part of this work (THEOLOGY.) We may here conſider it as an undeniable and a generally acknowledged fact, that a certain part of thoſe miracles were real. Such as were real undoubtedly contributed, in a very eminent manner, to the propagation of Chriſtianity; but they are not to be ranked among the natural and *ſecondary* cauſes.

It is difficult to diſtinguiſh at what period miraculous gifts ceaſed to be conferred on the members of the primitive church; yet we *may* diſtinguiſh, if we take pains to inquire with minute attention, at what period the evidence ceaſes to be ſatisfactory. We can alſo, by conſidering the circumſtances of the church through the ſeveral ſtages of its hiſtory, form ſome judgment concerning the period during which the gifts of propheſying, and ſpeaking with tongues, and working miracles, were moſt neceſſary to Chriſtians to enable them to aſſert the truth and dignity of their religion.

The Heathens were no ſtrangers to pretended miracles and prophecies, and other ſeeming interpoſitions of ſuperior beings, diſturbing the ordinary courſe of nature and of human affairs: but the miracles to which they were familiarized had been ſo often detected to be tricks of impoſture or pretences of mad enthuſiaſm, that, inſtead of being prepared to witneſs or to receive accounts of new miracles with eaſy credulity, they muſt have been in general diſpoſed to view them with jealouſy and ſuſpicion. Beſides, the miracles to which they had been accuſtomed, and thoſe performed by the apoſtles and the firſt preachers of Chriſtianity, were directly contradictory; and therefore the one could receive no aſſiſtance from the other.

Yet we muſt acknowledge, notwithſtanding what we have above advanced, that as diſagreements with reſpect to the principles and inſtitutions of their religion very early aroſe among Chriſtians; ſo they likewiſe ſought to extend its influence, at a very early period, by the uſe of *pious frauds*. Pious frauds, too, appear to have ſometimes ſerved the immediate purpoſes for which they were employed, though eventually they have been highly injurious to the cauſe of Chriſtianity.

We conclude, then, that Chriſtianity *was* indebted to the influence of miracles in a conſiderable degree for its propagation: but that the real miracles of our Saviour and his apoſtles, &c. were not among the *ſecondary* cauſes of its ſucceſs: that the Heathens who were to be converted were not very happily prepared for receiving the miracles of the goſpel with blind credulity: that, as it is poſſible to diſcern between ſufficient and inſufficient evidence, ſo it is not more difficult to diſtinguiſh between true and falſe miracles: and, laſtly, that falſe miracles were ſoon employed by Chriſtians as engines to ſupport and propagate their religion, and perhaps not unſucceſsfully; but were, upon the whole, more injurious than ſerviceable to the cauſe which they were called in to maintain.

26 Cauſe IV.

The *fourth of this ſeries of ſecondary cauſes*, which this author thinks to have been adequate to the propagation of Chriſtianity, is the virtues of the primitive Chriſtians. Theſe he is willing to attribute to other and leſs generous motives, rather than to the pure influence of the doctrines and precepts of their religion.

The firſt converts to Chriſtianity were moſt of them from among the loweſt and moſt worthleſs characters. The wiſe, the mighty, and thoſe who were diſtinguiſhed by ſpecious virtues, were in general perfectly ſatisfied with their preſent circumſtances and future proſpects. People whoſe minds were naturally weak, unenlightened, or oppreſſed with the ſenſe of atrocious guilt, and who were infamous or outcaſts from ſociety, were eager to graſp at the hopes which the goſpel held out to them.

When, after enliſting under the banner of Chriſt, they began to conſider themſelves as "born again to newneſs of life;" remorſe and fear, which eaſily prevail over weak minds; ſelfiſh hopes of regaining their reputation, and attaining to the honours and happineſs of thoſe manſions which Jeſus was ſaid to have gone to prepare; with a deſire to raiſe the honour and extend the influence of the ſociety of which they were become members; all together operated ſo powerfully as to enable them to diſplay both active and paſſive virtue in a very extraordinary degree. Their virtues did not flow from the pureſt and nobleſt ſource; yet they attracted the notice and moved the admiration of mankind. Of thoſe who admired, ſome were eager to imitate; and, in order to that, thought it neceſſary to adopt the ſame principles of action.

Their virtues, too, were rather of that ſpecies which excite wonder, becauſe uncommon, and not of eſſential utility in the ordinary intercourſe of ſociety; than of thoſe which are indiſpenſably neceſſary to the exiſtence of ſocial order, and contribute to the eaſe and convenience of life. Such virtues were well calculated to engage the imitation of thoſe who had failed egregiouſly in the practice of the more ſocial virtues.

Thus they practiſed extraordinary, but uſeleſs and unſocial virtues, upon no very generous motives; thoſe virtues drew upon them the eyes of the world, and induced numbers to embrace their faith.

27 Obſervations in anſwer.

We muſt, however unwillingly, declare, that this is plainly an uncandid account of the virtues of the primitive Chriſtians, and the motives from which they originated. The ſocial virtues are ſtrongly recommended through the goſpel. No degree of mortification or ſelf-denial, or ſecluſion from the ordinary buſineſs and amuſements of ſocial life, was required of the early converts to Chriſtianity; ſave what was indiſpenſably neceſſary to wean them from the irregular habits in which they had before indulged, and which had rendered them nuiſances in ſociety, and to form them to new habits equally neceſſary to their happineſs and their uſefulneſs in life. We allow that they practiſed virtues which in other circumſtances would, however ſplendid, have been unneceſſary. But in the difficult circumſtances in which the firſt Chriſtians were placed, the virtues which they practiſed were in the higheſt degree ſocial. The moſt prominent feature in their character was, "their continuing to entertain ſentiments of generous benevolence, and to diſcharge ſcrupulouſly all the ſocial duties," towards thoſe who exerciſed neither charity nor humanity, and frequently not even bare integrity and juſtice, in their conduct towards them.

It cannot be ſaid with truth, that ſuch a proportion of the primitive Chriſtians were people whoſe characters had been infamous and their circumſtances deſperate, as that the character of the religion which they embraced can ſuffer from this circumſtance. Nor were they *only* the weak and illiterate whom the apoſtles and their immediate ſucceſſors converted by their preaching. The criminal, to be ſure, rejoiced to hear that he might obtain abſolution of his crimes; the mourner was willing to receive comfort; minds of refined and generous feelings were deeply affected with that goodneſs which had induced the Son of God to ſubmit to the puniſhment due to ſinners: but the ſimplicity, the rationality, and the beauty of the Chriſtian ſyſtem, likewiſe prevailed in numerous inſtances over the pride and prejudices of the great and the wiſe: in ſo many inſtances, as are ſufficient to vindicate the Chriſtian church from the aſperſion by which it has been repreſented as being in the firſt period of its exiſtence merely a body of *criminals and idiots*.

The principles, too, from which the virtues of the firſt Chriſtians originated, were not peculiarly mean and ſelfiſh; nay, they ſeem to have been uncommonly ſublime and diſintereſted. Remorſe in the guilty mind is a natural and reaſonable ſentiment; the deſire of happineſs in every human breaſt is equally ſo. It is uncandid to cavil againſt the firſt Chriſtians for being, like the reſt of mankind, influenced by theſe ſentiments: And when we behold them overlooking temporary poſſeſſions and enjoyments, extending their views to futurity, and "living by faith;" when we obſerve them "doing good to thoſe who hated them, bleſſing thoſe who curſed them, and praying for thoſe by whom they were deſpitefully uſed:" can we deny their virtues to have been of the moſt generous and diſintereſted kind?

We allow, then, that the virtues of the firſt Chriſtians muſt have contributed to the propagation of their religion: but it is with pain that we obſerve this reſpectable writer ſtudiouſly labouring to miſrepreſent the principles from which thoſe virtues aroſe; and not only the principles from which they aroſe, but alſo their importance in ſociety.

28 Cauſe V. with obſervations.

The *fifth cauſe* was the mode of church government adopted by the firſt Chriſtians, by which they were knit together in one ſociety; who preferred the church and its intereſts to their country and civil concerns. We wiſh not to deny, that the mutual attachment of the primitive Chriſtians contributed to ſpread the influence of their religion; and the order which they maintained, in conſequence of being animated with this ſpirit of brotherly love, and with ſuch ardent zeal for the glory of God, muſt no doubt have produced no leſs happy effects among them than order and regularity produce on every other occaſion on which they are ſtrictly obſerved. But whether the form of church-government, which was gradually eſtabliſhed in the Chriſtian church, was actually the happieſt that could poſſibly have been adopted; or whether, by eſtabliſhing a diſtinct ſociety, with ſeparate intereſts, within the Roman empire, it contributed to the diſſolution of that mighty fabric, we cannot here pretend to inquire. Theſe are ſubjects of diſcuſſion, with reſpect to which we may with more propriety endeavour to ſatisfy our readers elſewhere.

29 General concluſion concerning the influence of the five cauſes.

From the whole of this review of what Mr Gibbon has ſo ſpeciouſly advanced concerning the influence of theſe five ſecondary cauſes in the propagation of the goſpel, we think ourſelves warranted to conclude, That the zeal of the firſt Chriſtians was not, as he repreſents it, intolerant: That the doctrine of the immortality of the human ſoul was ſomewhat better underſtood in the Heathen world, particularly among the Greeks and Romans and the Jews, than he repreſents it to have been; and had an influence ſomewhat happier than what he aſcribes to it: That the additional circumſtances by which, he tells us, the firſt preachers of Chriſtianity improved the effects of this doctrine, were far from being calculated to allure converts: That the heathens, therefore, were not quite ſo well prepared for an eager reception of this doctrine as he would perſuade us they were; and, of conſequence, could not be influenced by it in ſo conſiderable a degree in their converſion: That real, unqueſtionable miracles, performed by our Saviour, by his apoſtles, and by their ſucceſſors, *did* contribute ſignally to the propagation of Chriſtianity; but are not to be ranked among the ſecondary cauſes: That weakneſs and blind zeal did at times employ pretended miracles for the ſame purpoſe not altogether ineffectually: That though theſe deſpicable and wicked means might be in ſome inſtances ſucceſsful; yet they were, upon the whole, much more injurious than beneficial: That the virtues of the primitive Chriſtians aroſe from the moſt generous and noble motives, and were in their nature and tendency highly favourable to ſocial order, and to the comfort of mankind in the ſocial ſtate: And, laſtly, That the order and regularity of church-government, which were gradually eſtabliſhed among the firſt Chriſtians, contributed greatly to maintain the dignity and ſpread the influence of their religion; but do not appear to have disjoined them from their fellow-ſubjects, or to have rendered them inimical to the welfare of the ſtate of which they were members.

Upon the whole, then, we do not ſee that theſe ſecondary cauſes were equal to the effects that have been aſcribed to them; and it ſeems undeniable, that others of a ſuperior kind co-operated with them. We earneſtly recommend to the peruſal of the reader a valuable performance of Lord Hailes's, in which he inquires into Mr Gibbon's aſſertions and reaſonings, concerning the influence of theſe five cauſes, with the utmoſt accuracy of information, ſtrength, and clearneſs of reaſoning, and elegant ſimplicity of ſtyle, and without virulence or paſſion.

CHRISTIANS, thoſe who profeſs the religion of Chriſt: See CHRISTIANITY and MESSIAH.—The name *Chriſtian* was firſt given at Antioch, in the year 42, to ſuch as believed in Chriſt, as we read in the Acts: till that time they were called *diſciples*.

The firſt Chriſtians diſtinguiſhed themſelves in the moſt remarkable manner by their conduct and their virtues. The faithful, whom the preaching of St Peter had converted, hearkened attentively to the exhortations of the Apoſtles, who failed not carefully to inſtruct them, as perſons who were entering upon an entirely new life. They went every day to the temple with one heart and one mind, and continued in prayers; doing nothing different from the other Jews, becauſe it was yet not time to ſeparate from them. But they made a ſtill greater progreſs in virtue; for they ſold all that they poſſeſſed, and diſtributed their goods in proportion to the wants of their brethren. They *ate their meat with gladneſs and ſingleneſs of heart, praiſing God, and having favour with all the people.* St Chryſoſtom, examining from what ſource the eminent virtue of the firſt Chriſtians flowed, aſcribes it principally to their diveſting themſelves of their poſſeſſions: "For (ſays the father) perſons from whom all that they have is taken away, are not ſubject to ſin: whereas, whoever has large poſſeſſions, wants not a devil or a tempter to draw him into hell by a thouſand ways."

The Jews were the firſt and the moſt inveterate enemies the Chriſtians had. They put them to death as often as they had it in their power: and when they revolted againſt the Romans in the time of the emperor Adrian, Barchochebas, the head of that revolt, employed againſt the Chriſtians the moſt rigorous puniſhments to compel them to blaſpheme and renounce Jeſus Chriſt. And we find that, even in the third century, they endeavoured to get into their hands Chriſtian women, in order to ſcourge and ſtone them in their ſynagogues. They curſed the Chriſtians ſolemnly three times a-day in their ſynagogues, and their rabbins would not ſuffer them to converſe with Chriſtians upon any occaſion. Nor were they contented to hate and deteſt them; but they diſpatched emiſſaries all over the world to defame the Chriſtians, and ſpread all ſorts of calumnies againſt them. They accuſed them, among other things, of worſhipping the ſun and the head of an aſs. They reproached them with idleneſs, and being an uſeleſs race of people. They charged them with treaſon, and endeavouring to erect a new monarchy againſt that of the Romans. They affirmed, that, in celebrating their myſteries, they uſed to kill a child and eat its fleſh. They accuſed them of the moſt ſhocking inceſts, and of intemperance in their feaſts of charity. But the lives and behaviour of the firſt Chriſtians were ſufficient to refute all that was ſaid againſt them, and evidently demonſtrated that theſe accuſations were mere calumny and the effect of inveterate malice.

Pliny the younger, who was governor of Pontus and Bithynia between the years 103 and 105, gives a very particular account of the Chriſtians in that province, in a letter which he wrote to the emperor Trajan, of which the following is an extract: "I take the liberty, Sir, to give you an account of every difficulty which ariſes to me. I have never been preſent at the examination of the Chriſtians; for which reaſon I know not what queſtions have been put to them, nor in what manner they have been puniſhed. My behaviour towards thoſe who have been accuſed to me has been this: I have interrogated them, in order to know whether they were really Chriſtians. When they have confeſſed it, I have repeated the ſame queſtion two or three times, threatening them with death if they did not renounce this religion. Thoſe who have perſiſted in their confeſſion, have been, by my order, led to puniſhment. I have even met with ſome Roman citizens guilty of this phrenſy, whom, in regard to their quality, I have ſet apart from the reſt, in order to ſend them to Rome. Theſe perſons declare, that their whole crime, if they are guilty, conſiſts in this; that, on certain days, they aſſemble before ſunriſe, to ſing alternately the praiſes of Chriſt, as of a god, and to oblige themſelves, by the performance of their religious rites, not to be guilty of theft, or adultery, to obſerve inviolably their word, and to be true to their truſt. This depoſition has obliged me to endeavour to inform myſelf ſtill farther of this matter, by putting to the torture two of their women-ſervants, whom they call *deaconeſſes*; but I could learn nothing more from them, than that the ſuperſtition of theſe people is as ridiculous as their attachment to it is aſtoniſhing."

There is extant a juſtification, or rather panegyric, of the Chriſtians, pronounced by the mouth of a Pagan prince. It is a letter of the emperor Antoninus, written in the year 152, in anſwer to the States of Aſia, who had accuſed the Chriſtians of being the cauſe of ſome earthquakes which had happened in that

that part of the world. The emperor adviſes them to "take care, leſt, in torturing and puniſhing thoſe whom they accuſed of Atheiſm (meaning the Chriſtians), they ſhould render them more obſtinate, inſtead of prevailing upon them to change their opinion; ſince their religion taught them to ſuffer with pleaſure for the ſake of God." As to the earthquakes which had happened, he put them in mind, "that they themſelves are always diſcouraged, and ſink under ſuch misfortunes; whereas the Chriſtians never diſcovered more chearfulneſs and confidence in God than upon ſuch occaſions." He tells them, that "they pay no regard to religion, and neglect the worſhip of the Eternal; and, becauſe the Chriſtians honour and adore Him, therefore they are jealous of them, and perſecute them even to death." He concludes: "Many of the governors of provinces have formerly written to my father concerning them; and his anſwer always was, that they ſhould not be moleſted or diſturbed, provided they quietly ſubmitted to the authority of the government. Many perſons have likewiſe conſulted me upon this affair, and I have returned the ſame anſwer to them all; namely, that if any one accuſes a Chriſtian merely on account of his religion, the accuſed perſon ſhall be acquitted, and the accuſer himſelf puniſhed." This ordinance, according to Euſebius, was publicly fixed up at Epheſus in an aſſembly of the ſtates.

It is no difficult matter to diſcover the cauſes of the many perſecutions to which the Chriſtians were expoſed during the three firſt centuries. The purity of the Chriſtian morality, directly oppoſite to the corruption of the Pagans, was doubtleſs one of the moſt powerful motives of the public averſion. To this may be added, the many calumnies unjuſtly ſpread about concerning them by their enemies, particularly the Jews. And this occaſioned ſo ſtrong a prejudice againſt them, that the Pagans condemned them without inquiring into their doctrine, or permitting them to defend themſelves. Beſides, their worſhipping Jeſus Chriſt, as God, was contrary to one of the moſt ancient laws of the Roman empire, which expreſsly forbade the acknowledging of any God which had not been approved by the ſenate.

But notwithſtanding the violent oppoſition made to the eſtabliſhment of the Chriſtian religion, it gained ground daily, and very ſoon made a ſurpriſing progreſs in the Roman empire. In the third century, there were Chriſtians in the camp, in the ſenate, in the palace: in ſhort everywhere, but in the temples and the theatres: they filled the towns, the country, the iſlands. Men and women of all ages and conditions, and even thoſe of the firſt dignities, embraced the faith; inſomuch that the Pagans complained that the revenues of their temples were ruined. They were in ſuch great numbers in the empire, that (as Tertullian expreſſes it) were they to have retired into another country, they would have left the Romans only a frightful ſolitude.

The primitive Chriſtians were not only remarkable for the practice of every virtue; they were alſo very eminently diſtinguiſhed by the many miraculous gifts and graces beſtowed by God upon them. "Some of the Chriſtians (ſays Irenæus) drive out devils, not in appearance only, but ſo as that they never return: whence it often happens, that thoſe who are diſpoſſeſſed of evil ſpirits embrace the faith and are received into the church. Others know what is to come, ſee viſions, and deliver oracles as prophets. Others heal the ſick by laying their hands on them, and reſtore them to perfect health: and we find ſome who even raiſe the dead.—It is impoſſible to reckon up the gifts and graces which the church has received from God—what they have freely received they as freely beſtow. They obtain theſe gifts by prayer alone, and invocation of the name of Jeſus Chriſt, without any mixture of enchantment or ſuperſtition."

We ſhall here ſubjoin the remarkable ſtory, atteſted by Pagan authors themſelves, concerning the *Chriſtian Legion* in the army of the emperor Marcus Aurelius. That prince having led his forces againſt the Quadi, a people on the other ſide of the Danube, was ſurrounded and hemmed in by the enemy in a diſadvantageous place, and where they could find no water. The Romans were greatly embarraſſed, and, being preſſed by the enemy, were obliged to continue under arms, expoſed to the violent heat of the ſun, and almoſt dead with thirſt; when, on a ſudden, the clouds gathered, and the rain fell in great abundance. The ſoldiers received the water in their bucklers and helmets, and ſatisfied both their own thirſt and that of their horſes. The enemy, preſently after, attacked them; and ſo great was the advantage they had over them, that the Romans muſt have been overthrown, had not heaven again interpoſed by a violent ſtorm of hail, mixed with lightning, which fell on the enemy, and obliged them to retreat. It was found afterwards, that one of the legions, which conſiſted of Chriſtians, had by their prayers, which they offered up on their knees before the battle, obtained this favour from heaven: and from this event that legion was ſurnamed *The Thundering Legion*. See, however, the criticiſm of Mr Moyle on this ſtory in his *Works*, vol. ii. p. 81.—390. See alſo *Moſheim's Church Hiſtory*, vol. i. p. 124.

Such were the primitive Chriſtians, whoſe religion has by degrees ſpread itſelf over all parts of the world, though not with equal purity in all. And though, by the providence of God, Mahometans and Idolaters have been ſuffered to poſſeſs themſelves of thoſe places in Greece, Aſia, and Africa, where the Chriſtian religion formerly moſt flouriſhed; yet there are ſtill ſuch remains of the Chriſtian religion among them as to give them opportunity ſufficient to be converted. For, in the dominions of the Turk in Europe, the Chriſtians make two third parts at leaſt of the inhabitants; and in Conſtantinople itſelf there are above twenty Chriſtian churches, and above thirty in Theſſalonica. Philadelphia, now called *Ala-ſhahir*, has no fewer than twelve Chriſtian churches. The whole iſland of Chio is governed by Chriſtians; and ſome iſlands of the Archipelago are inhabited by Chriſtians only. In Africa, beſides the Chriſtians living in Egypt, and in the kingdom of Congo and Angola, the iſlands upon the weſtern coaſts are inhabited by Chriſtians; and the vaſt kingdom of Abyſſinia, ſuppoſed to be as big as Germany, France, Spain, and Italy, put together, is poſſeſſed by Chriſtians. In Aſia, moſt part of the empire of Ruſſia, the countries of Circaſſia and Mingrelia, Georgia, and Mount Libanus, are inhabited

habited only by Chriſtians. In America, it is notorious that the Chriſtians are very numerous, and ſpread over moſt parts of that vaſt continent.

Christians of St John, a ſect of Chriſtians very numerous in Balſara and the neighbouring towns: they formerly inhabited along the river Jordan, where St John baptized, and it was from thence they had their name. They hold an anniverſary feaſt of five days; during which they all go to the biſhop, who baptizes them with the baptiſm of St John. Their baptiſm is alſo performed in rivers, and that only on Sundays: they have no notion of the third perſon in the Trinity; nor have they any canonical book, but abundance full of charms, &c. Their biſhoprics deſcend by inheritance, as our eſtates do, though they have the ceremony of an election.

Christians of St Thomas, a ſort of Chriſtians in a peninſula of India on this ſide of the gulf: they inhabit chiefly at Cranganor, and the neighbouring country: theſe admit of no images; and receive only the croſs, to which they pay a great veneration: they affirm, that the ſouls of the ſaints do not ſee God till after the day of judgment: they acknowledge but three ſacraments, viz. baptiſm, orders, and the euchariſt; they make no uſe of holy oils in the adminiſtration of baptiſm; but, after the ceremony, anoint the infant with an unction compoſed of oil and walnuts, without any benediction. In the euchariſt, they conſecrate with little cakes made of oil and ſalt, and inſtead of wine make uſe of water in which raiſins have been infuſed.

CHRISTIANA, a town of Norway, in the province of Aggerhuys, ſituated in a bay of the ſea. E. Long. 10. 20. N. Lat. 59. 30.

CHRISTIANOPLE, a port-town of Sweden, ſituated on the Baltic ſea, in the territory of Bleckingen, and province of South Gothland. E. Long. 15. 47. N. Lat. 57°.

CHRISTIANSTADT, a ſtrong fortified town of Sweden; ſituated in the territory of Bleckingen and province of South Gothland. It was built in 1614 by Chriſtian IV. king of Denmark, when this province belonged to the Danes; and finally ceded to the Swedes by the peace of Roſkild in 1658. The town is ſmall but neatly built, and is eſteemed the ſtrongeſt fortreſs in Sweden. The houſes are all of brick, and moſtly ſtuccoed white. It ſtands in a marſhy plain cloſe to the river Helge a, which flows into the Baltic at Ahus, about the diſtance of 20 miles, and is navigable only for ſmall craft of ſeven tons burden. Engliſh veſſels annually reſort to this port for alum, pitch, and tar. The inhabitants have manufactures of cloth and ſilken ſtuffs, and carry on a ſmall degree of commerce. E. Long. 14. 40. N. Lat. 56. 30.

CHRISTINA, daughter of Guſtavus Adolphus king of Sweden, was born in 1626; and ſucceeded to the crown in 1633, when only ſeven years of age. This princeſs diſcovered even in her infancy, what ſhe afterwards expreſſed in her memoirs, an invincible antipathy for the employments and converſation of women; and ſhe had the natural awkwardneſs of a man with reſpect to all the little works which generally fall to their ſhare. She was, on the contrary, fond of violent exerciſes, and ſuch amuſements as conſiſt in feats of ſtrength and activity. She had alſo both ability and taſte for abſtracted ſpeculations; and amuſed herſelf with language and the ſciences, particularly that of legiſlation and government. She derived her knowledge of ancient hiſtory from its ſource; and Polybius and Thucydides were her favourite authors. As ſhe was the ſovereign of a powerful kingdom, it is not ſtrange that almoſt all the princes in Europe aſpired to her bed. Among others, were the prince of Denmark, the elector Palatine, the elector of Brandenburg, the king of Spain, the king of the Romans, Don John of Auſtria, Sigiſmund of Rockocvi, count and general of Caſſovia; Staniſlaus king of Poland; John Caſſimir his brother; and Charles Guſtavus duke of Deux Ponts, of the Bavarian Palatinate family, ſon of her father the great Guſtavus's ſiſter, and conſequently her firſt couſin. To this nobleman, as well as to all his competitors, ſhe conſtantly refuſed her hand; but ſhe cauſed him to be appointed her ſucceſſor by the ſtates. Political intereſts, differences of religion, and contrariety of manners, furniſhed Chriſtina with pretences for rejecting all her ſuitors; but her true motives were the love of independence, and a ſtrong averſion ſhe had conceived, even in her infancy, from the marriage yoke. "Do not force me to marry (ſaid ſhe to the ſtates); for if I ſhould have a ſon, it is not more probable that he ſhould be an Auguſtus than a Nero."

An accident happened in the beginning of her reign, which gave her a remarkable opportunity of diſplaying the ſtrength and equanimity of her mind. As ſhe was at the chapel of the caſtle of Stockholm, aſſiſting at divine ſervice with the principal lords of her court, a poor wretch, who was diſordered in his mind, came to the place with a deſign to aſſaſſinate her. This man, who was preceptor of the college, and in the full vigour of his age, choſe, for the execution of his deſign, the moment in which the aſſembly was performing what in the Swediſh church is called an *act of recollection*; a ſilent and ſeparate act of devotion, performed by each individual kneeling and hiding the face with the hand. Taking this opportunity, he ruſhed through the crowd, and mounted a balluſtrade within which the queen was upon her knees. The Baron Braki, chief juſtice of Sweden, was alarmed, and cried out; and the guards croſſed their partiſans, to prevent his coming further: but he ſtruck them furiouſly on one ſide; leaped over the barrier; and, being then cloſe to the queen, made a blow at her with a knife which he had concealed without a ſheath in his ſleeve. The queen avoided the blow, and puſhed the captain of her guards, who inſtantly threw himſelf upon the aſſaſſin, and ſeized him by the hair. All this happened in leſs than a moment of time. The man was known to be mad, and therefore nobody ſuppoſed he had any accomplices: they therefore contented themſelves with locking him up; and the queen returned to her devotion without the leaſt emotion that could be perceived by the people, who were much more frightened than herſelf.

One of the great affairs that employed Chriſtina while ſhe was upon the throne, was the peace of Weſtphalia, in which many claſhing intereſts were to be reconciled, and many claims to be aſcertained. It was concluded in the month of October 1648. The ſucceſs of the Swediſh arms rendered Chriſtina the arbitreſs of this treaty; at leaſt as to the affairs of Sweden, to which this peace confirmed the poſſeſſion of many important countries. No public event of importance took place during the reſt of Chriſtina's reign; for there were neither wars abroad, nor troubles at home. This quiet might be the effect of chance; but it might alſo be the effect of a good adminiſtration, and the great reputation of the queen; and the love her people had for her ought to lead us to this determination. Her reign was that of learning and genius. She drew about her, wherever ſhe was, all the diſtinguiſhed characters of her time: Grotius, Paſchal, Bochart, Deſcartes, Gaſſendi, Saumaiſe, Naude, Voſſius, Heinſius, Meibom, Scudery, Menage, Lucas, Holſtentius, Lambecius, Bayle, Madam Dacier, Filicaia, and many others. The arts never fail to immortalize the prince who protects them; and almoſt all theſe illuſtrious perſons have celebrated Chriſtina, either in poems, letters, or literary productions of ſome other kind, the greater part of which are now forgotten. They form, however, a general cry of praiſe, and a maſs of teſtimonials which may be conſidered as a ſolid baſis of reputation. Chriſtina, however, may be juſtly reproached with want of taſte, in not properly aſſigning the rank of all theſe perſons, whoſe merits, though acknowledged, were yet unequal; particularly for not having been ſufficiently ſenſible of the ſuperiority of Deſcartes, whom ſhe diſguſted, and at laſt wholly neglected. The rapid fortune which the adventurer Michon, known by the name of *Bourdelot*, acquired by her countenance and liberality, was alſo a great ſcandal to literature. He had no pretenſions to learning; and though ſprightly was yet indecent. He was brought to court by the learned Saumaiſe; and, for a time, drove literary merit out of it, making learning the object of his ridicule, and exacting from Chriſtina an exorbitant tribute to the weakneſs and inconſtancy of her ſex; for even Chriſtina, with reſpect to this man, ſhowed herſelf to be weak and inconſtant. At laſt ſhe was compelled, by the public indignation, to baniſh this unworthy minion: and he was no ſooner gone than her regard for him was at an end. She was aſhamed of the favour ſhe had ſhown him; and, in a ſhort time, thought of him with hatred or contempt. This Bourdelot, during his aſcendency over the queen, had ſupplanted Count Magnus de la Gardie, ſon of the conſtable of Sweden, who was a relation, a favourite, and perhaps the lover of Chriſtina. M. de Mottville, who had ſeen him ambaſſador in France, ſays, in his memoirs, that he ſpoke of his queen in terms ſo paſſionate and reſpectful, that every one concluded his attachment to her to be more ardent and tender than a mere ſenſe of duty can produce. This nobleman fell into diſgrace becauſe he ſhowed an inclination to govern; while M. Bourdelot ſeemed to aim at nothing more than to amuſe; and concealed, under the unſuſpected character of a droll, the real aſcendency which he exerciſed over the queen's mind.

About this time, an accident happened to Chriſtina which brought her into ſtill greater danger than that which has been related already. Having given orders for ſome ſhips of war to be built at the port of Stockholm, ſhe went to ſee them when they were finiſhed; and as ſhe was going on board of them, croſs a narrow plank, with Admiral Fleming, his foot ſlipping, he fell, and drew the queen with him into the ſea, which in that place was near 90 feet deep. Anthony Steinberg, the queen's firſt equerry, inſtantly threw himſelf into the water, laid hold of her robe, and, with ſuch aſſiſtance as was given him, got the queen aſhore: during this accident, her recollection was ſuch, that the moment her lips were above water, ſhe cried out, "Take care of the admiral." When ſhe was got out of the water, ſhe diſcovered no emotion either by her geſture or countenance; and ſhe dined the ſame day in public, where ſhe gave a humorous account of her adventure.

But though at firſt ſhe was fond of the power and ſplendor of royalty, yet ſhe began at length to feel that it embarraſſed her; and the ſame love of independence and liberty which had determined her againſt marriage, at laſt made her weary of the crown. As, after her firſt diſguſt, it grew more and more irkſome to her, ſhe reſolved to abdicate; and, in 1652, communicated her reſolution to the ſenate. The ſenate zealouſly remonſtrated againſt it; and was joined by the people; and even by Charles Guſtavus himſelf, who was to ſucceed her: ſhe yielded to their importunities, and continued to ſacrifice her own pleaſure to the will of the public till the year 1654, and then ſhe carried her deſign into execution. It appears by one of her letters to M. Canut, in whom ſhe put great confidence, that ſhe had meditated this project for more than eight years; and that ſhe had communicated it to him five years before it took place.

The ceremony of her abdication was a mournful ſolemnity, a mixture of pomp and ſadneſs, in which ſcarce any eyes but her own were dry. She continued firm and compoſed through the whole; and, as ſoon as it was over, prepared to remove into a country more favourable to ſcience than Sweden was. Concerning the merit of this action, the world has always been divided in opinion; it has been condemned alike both by the ignorant and the learned, the trifler and the ſage. It was admired, however, by the great Conde: "How great was the magnanimity of this princeſs (ſaid he), who could ſo eaſily give up that for which the reſt of mankind are continually deſtroying each other, and which ſo many throughout their whole lives purſue without attaining!" It appears, by the works of St Evremond, that the abdication of Chriſtina was at that time the univerſal topic of ſpeculation and debate in France. Chriſtina, beſides abdicating her crown, abjured her religion: but this act was univerſally approved by one party and cenſured by another; the papiſts triumphed, and the proteſtants were offended. No prince, after a long impriſonment, ever ſhowed ſo much joy upon being reſtored to his kingdom, as Chriſtina did in quitting hers. When ſhe came to a little brook, which ſeparates Sweden from Denmark, ſhe got out of her carriage; and leaping on the other ſide, cried out in a tranſport of joy, "At laſt I am free, and out of Sweden, whither, I hope, I ſhall never return." She diſmiſſed her women, and laid by the habit of her ſex: "I would become a man (ſaid ſhe); yet I do not love men becauſe they are men, but becauſe they are not women." She made her abjuration at Bruſſels; where ſhe ſaw the great Conde, who, after his defection, made that city his aſylum. "Couſin (ſaid ſhe), who would have thought, ten years ago, that we ſhould have met at this diſtance from our countries?"

The inconſtancy of Chriſtina's temper appeared in her going continually from place to place: from Bruſſels ſhe went to Rome; from Rome to France, and from France ſhe returned to Rome again; after this ſhe went to Sweden, where ſhe was not very well received; from Sweden ſhe went to Hamburgh, where ſhe continued a year, and then went again to Rome; from Rome ſhe returned to Hamburgh; and again to Sweden, where ſhe was ſtill worſe received than before; upon which ſhe went back to Hamburgh, and from Hamburgh again to Rome. She intended another journey to Sweden; but it did not take place, any more than an expedition to England, where Cromwell did not ſeem well diſpoſed to receive her; and after many wanderings, and many purpoſes of wandering ſtill more, ſhe at laſt died at Rome in 1689.

It muſt be acknowledged, that her journeys to Sweden had a motive of neceſſity; for her appointments were very ill paid, though the ſtates often confirmed them after her abdication: but to other places ſhe was led merely by a roving diſpoſition; and, what is more to her diſcredit, ſhe always diſturbed the quiet of every place ſhe came into, by exacting greater deference to her rank as queen than ſhe had a right to expect, by her total non-conformity to the cuſtoms of the place, and by continually exciting and fomenting intrigues of ſtate. She was indeed always too buſy, even when ſhe was upon the throne; for there was no event in Europe in which ſhe was not ambitious of acting a principal part. During the troubles in France by the faction called the *Fronde*, ſhe wrote with great eagerneſs to all the intereſted parties, officiouſly offering her mediation to reconcile their intereſts, and calm their paſſions, the ſecret ſprings of which it was impoſſible ſhe ſhould know. This was firſt thought a dangerous, and afterwards a ridiculous behaviour. During her reſidence in France ſhe gave univerſal diſguſt, not only by violating all the cuſtoms of the country, but by practiſing others directly oppoſite. She treated the ladies of the court with the greateſt rudeneſs and contempt: when they came to embrace her, ſhe, being in man's habit, cried out, "What a ſtrange eagerneſs have theſe women to kiſs me! is it becauſe I look like a man?"

But though ſhe ridiculed the manners of the French court, ſhe was very ſolicitous to enter into its intrigues. Louis XIV. then very young, was enamoured of Mademoiſelle de Mancini, niece to Cardinal Mazarine; Chriſtina flattered their paſſion, and offered her ſervice. "I would fain be your confident (ſaid ſhe); if you love, you muſt marry."

The murder of Monaldechi is, to this hour, an inſcrutable myſtery. It is, however, of a piece with the expreſſions conſtantly uſed by Chriſtina in her letters, with reſpect to thoſe with whom ſhe was offended; for ſhe ſcarce ever ſignified her diſpleaſure without threatening the life of the offender. "If you fail in your duty, (ſaid ſhe to her ſecretary, whom ſhe ſent to Stockholm after her abdication), not all the power of the king of Sweden ſhall ſave your life, though you ſhould take ſhelter in his arms." A muſician having quitted her ſervice for that of the duke of Savoy, ſhe was ſo tranſported with rage as to diſgrace herſelf by theſe words, in a letter written with her own hand: "He lives only for me: and if he does not ſing for me, he ſhall not ſing long for any body."

Bayle was alſo threatened for having ſaid that the letter which Chriſtina wrote, upon the revocation of the edict of Nantes, was "a remain of Proteſtantiſm;" but he made his peace by apologies and ſubmiſſion. See the article Bayle.

Upon the whole, ſhe appears to have been an uncommon mixture of faults and great qualities; which, however it might excite fear and reſpect, was by no means amiable. She had wit, taſte, parts, and learning: ſhe was indefatigable upon the throne; great in private life; firm in miſfortunes; impatient of contradiction; and, except in her love of letters, inconſtant in her inclinations. The moſt remarkable inſtance of this fickleneſs is, That after ſhe had abdicated the crown of Sweden, ſhe intrigued for that of Poland. She was, in every action and purſuit, violent and ardent in the higheſt degree; impetuous in her deſires, dreadful in her reſentment, and fickle in her conduct.

She ſays of herſelf, that, "ſhe was miſtruſtful, ambitious, paſſionate, haughty, impatient, contemptuous, ſatirical, incredulous, undevout, of an ardent and violent temper, and extremely amorous;" a diſpoſition, however, to which, if ſhe may be believed, her pride and her virtue were always ſuperior. In general, her failings were thoſe of her ſex, and her virtues the virtues of ours.

Santa Christina, one of the Marquesas *Iſlands*.

CHRISTMAS day, a feſtival of the Chriſtian church; obſerved on the 25th of December, in memory of the *nativity* or birth of Jeſus Chriſt. As to the antiquity of this feſtival, the firſt footſteps we find of it are in the ſecond century, about the time of the emperor Commodus. The decretal epiſtles indeed carry it up a little higher; and ſay that Teleſphorus, who lived in the reign of Antoninus Pius, ordered divine ſervice to be celebrated, and an angelical hymn to be ſung, the night before the nativity of our Saviour. However, that it was kept before the times of Conſtantine, we have a melancholy proof: for whilſt the perſecution raged under Diocleſian, who then kept his court at Nicomedia, that prince, among other acts of cruelty, finding multitudes of Chriſtians aſſembled together to celebrate Chriſt's nativity, commanded the church doors where they were met to be ſhut, and fire to be put to it, which, in a ſhort time, reduced them and the church to aſhes.

CHRISTOPHER's, St, one of the Caribbee iſlands, in America, lying on the north-weſt of Nevis, and about 60 miles weſt of Antigua. It was formerly inhabited by the French and Engliſh; but, in 1713, it was ceded entirely to the latter. In 1782, it was taken by the French, but reſtored to Britain at the peace. It is about 20 miles in breadth, and ſeven in length; and has high mountains in the middle, whence rivulets run down. Between the mountains are dreadful rocks, horrid precipices, and thick woods; and in the ſouth-weſt part of the iſland, hot ſulphureous ſprings at the foot of them. The air is good; the ſoil light, ſandy, and fruitful; but the iſland is ſubject to hurricanes. The produce is chiefly ſugar, cotton, ginger, indigo, and the tropical fruits. W. Long. 62. 32. N. Lat. 17. 30.

CHROASTACES, in *Natural Hiſtory*, a genus of pellucid gems, comprehending all thoſe of variable colours, as viewed in different lights; of which kinds are the *opal* and the *aſteria* or *oculus cati*. See OPAL and ASTERIA.

CHROMATIC, a kind of muſic which proceeds by ſeveral ſemitones in ſucceſſion. The word is derived from the Greek χρῶμα, which ſignifies *colour*. For this denomination ſeveral cauſes are aſſigned, of which none appear certain, and all equally unſatisfactory. Inſtead, therefore, of fixing upon any, we ſhall offer a conjecture of our own; which, however, we do not impoſe upon the reader as more worthy of his attention than any of the former. Χρῶμα may perhaps not only ſignify a *colour*, but that ſhade of a colour by which it melts into another, or what the French call *nuance*. If this interpretation be admitted, it will be highly applicable to ſemitones; which being the ſmalleſt interval allowed in the diatonic ſcale, will moſt eaſily run one into another. To find the reaſons aſſigned by the ancients for this denomination, and their various diviſions of the chromatic ſpecies, the reader may have recourſe to the ſame article in Rouſſeau's Muſical Dictionary. At preſent, that ſpecies conſiſts in giving ſuch a procedure to the fundamental baſs, that the parts in the harmony, or at leaſt ſome of them, may proceed by ſemitones, as well in riſing as deſcending; which is moſt frequently found in the minor mode, from the alterations to which the ſixth and ſeventh note are ſubjected, by the nature of the mode itſelf.

The ſucceſſive ſemitones uſed in the *chromatic* ſpecies are rarely of the ſame kind; but alternatively major and minor, that is to ſay, *chromatic* and *diatonic*: for the inverval of a minor tone contains a minor or chromatic ſemitone, and another which is major or diatonic; a meaſure which temperament renders common to all tones: ſo that we cannot proceed by two minor ſemitones which are conjunctive in ſucceſſion, without entering into the enharmonic ſpecies; but two major ſemitones twice follow each other in the *chromatic* order of the ſcale.

The moſt certain procedure of the fundamental baſs to generate the chromatic elements in aſcent, is alternately to deſcend by thirds, and riſe by fourths, whilſt all the chords carry the third major. If the fundamental baſs proceeds from dominant to dominant by perfect cadences avoided, it produces the *chromatic* in deſcending. To produce both at once, you interweave the perfect and broken cadences, but at the ſame time avoid them.

As at every note in the *chromatic* ſpecies one muſt change the tone, that ſucceſſion ought to be regulated and limited for fear of deviation. For this purpoſe, it will be proper to recollect, that the ſpace moſt ſuitable to *chromatic* movements, is between the extremes of the dominant and the tonic in aſcending, and between the tonic and the dominant in deſcending. In the major mode, one may alſo chromatically deſcend from the dominant upon the ſecond note. This tranſition is very common in Italy; and, notwithſtanding its beauty, begins to be a little too common amongſt us.

The chromatic ſpecies is admirably fitted to expreſs grief and affliction; theſe ſounds boldly ſtruck in aſcending tear the ſoul. Their power is no leſs magical in deſcending; it is then that the ear ſeems to be pierced with real groans. Attended with its proper harmony, this ſpecies appears proper to expreſs every thing: but its completion, by concealing the melody, ſacrifices a part of its expreſſion; and for this diſadvantage, ariſing from the fulneſs of the harmony, it can only be compenſated by the nature and genius of the movement. We may add, that in proportion to the energy of this ſpecies, the compoſer ought to uſe it with greater caution and parſimony; like thoſe elegant viands, which, when profuſely adminiſtered, immediately ſurfeit us with their abundance; as much as they delight us when enjoyed with temperance, ſo much do they diſguſt when devoured with prodigality.

CHROMATIC, *Enharmonic*. See ENHARMONIC.

CHROMATICS;

THAT part of optics which explains the ſeveral properties of the colours of light, and of natural bodies.

1 Different hypotheſes concerning colours.

Before the time of Sir Iſaac Newton, we find no hypotheſis concerning colours of any conſequence. The opinions of the old philoſophers, however, we ſhall briefly mention, in order to gratify the curioſity of our readers. The Pythagoreans called colour the ſuperficies of body. Plato ſaid that it was a flame iſſuing from them. According to Zeno, it is the firſt configuration of matter; and Ariſtotle ſaid, it was that which moved bodies actually tranſparent. Des Cartes aſſerted, that colour is a modification of light; but he imagined, that the difference of colour proceeds from the prevalence of the direct or rotatory motion of the particles of light. Father Grimaldi, Dechales, and many others, thought the difference of colour depended upon the quick or ſlow vibrations of a certain elaſtic medium filling the whole univerſe. Rohault imagined that the different colours were made by the rays of light entering the eye at different angles with reſpect to the optic axis; and from the phenomena of the rainbow, he pretended to calculate the preciſe quantity of the angle that conſtituted each particular colour. Laſtly, Dr Hooke, the rival of Newton, imagined that colour is cauſed by the ſenſation of the oblique or uneven pulſe of light; and this being capable of no more than two varieties, he concluded there could be no more than two primary colours.

2 This ſubject inveſtigated by Sir Iſaac Newton.

In the year 1666, Sir Iſaac Newton began to inveſtigate this ſubject; and finding the coloured image of the ſun, formed by a glaſs priſm, to be of an oblong, and not of a circular form, as, according to the laws of refraction, it ought to be, he began to conjecture that light is not *homogeneal;* but that it conſiſts of rays, ſome of which are much more refrangible than others. See this diſcovery fully explained and aſcertained under the article OPTICS.

This method of accounting for the different colours of bodies, from their reflecting this or that kind of rays moſt copiouſly, is ſo eaſy and natural, that Sir Iſaac's ſyſtem quickly overcame all objections, and to this day continues to be almoſt univerſally believed. It is now acknowledged, that the light of the ſun, which to us ſeems perfectly homogeneal and white, is compoſed of no fewer than ſeven different colours, viz. red, orange, yellow, green, blue, purple, and violet or indigo. A body which appears of a red colour hath the property of reflecting the red rays more powerfully than any of the others; and ſo of the orange, yellow, green, &c. A body which is of a black colour, inſtead of reflecting, *abſorbs* all or the greateſt part of the rays that fall upon it; and, on the contrary, a body which appears white reflects the greateſt part of the rays indiſcriminately, without ſeparating the one from the other.

The foundation of a rational theory of colours being thus laid, it next became natural to inquire, by what peculiar mechaniſm in the ſtructure of each particular body it was fitted to reflect one kind of rays more than another? This Sir Iſaac Newton attributes to the denſity of theſe bodies. Dr Hooke had remarked, that thin tranſparent ſubſtances, particularly water and ſoap blown into bubbles, exhibited various colours according to their thinneſs; though, when they have a conſiderable degree of thickneſs, they appear colourleſs; and Sir Iſaac himſelf had obſerved, that as he was compreſſing two priſms hard together, in order to make their ſides (which happened to be a little convex) to touch one another, in the place of contact they were both perfectly tranſparent, as if they had been but one continued piece of glaſs. Round the point of contact, where the glaſſes were a little ſeparated from each other, rings of different colours appeared. To obſerve more nicely the order of the colours produced in this manner, he took two object-glaſſes; one of them a plano-convex one belonging to a 14 feet refracting teleſcope, and the other a large double convex one for a teleſcope of about 50 feet; and laying the former of them upon the latter, with its plain ſide downwards, he preſſed them ſlowly together; by which means the colours very ſoon emerged, and appeared diſtinct to a conſiderable diſtance. Next to the pellucid centrical ſpot, made by the contact of the glaſſes, ſucceeded blue, white, yellow, and red. The blue was very little in quantity, nor could he diſcern any violet in it; but the yellow and red were very copious, extending about as far as the white, and four or five times as far as the blue. The next circuit immediately ſurrounding theſe, conſiſted of violet, blue, green, yellow, and red: all theſe were copious and vivid, except the green, which was very little in quantity, and ſeemed more faint and dilute than the other colours. Of the other four the violet was the leaſt in extent; and the blue leſs than the yellow or red. The third circle of colours was purple, blue, green, yellow, and red. In this the purple ſeemed more reddiſh than the violet in the former circuit, and the green was more conſpicuous; being as briſk and copious as any of the other colours, except the yellow; but the red began to be a little faded, inclining much to purple. The fourth circle conſiſted of green and red; and of theſe the green was very copious and lively, inclining on the one ſide to blue, and on the other to yellow; but in this fourth circle there was neither violet, blue, nor yellow, and the red was very imperfect and dirty. All the ſucceeding colours grew more and more imperfect and dilute, till after three or four revolutions they ended in perfect whiteneſs.

3
Colours appearing between two glaſs plates.

4
Suppoſed to ariſe from denſity.

As the colours were thus found to vary according to the different diſtances of the glaſs plates from each other; our author thought that they proceeded from the different thickneſs of the plate of air intercepted between the glaſſes; this plate of air being, by the mere circumſtance of thinneſs or thickneſs, diſpoſed to reflect or tranſmit this or that particular colour. From this he concluded, as already obſerved, that the colours of all natural bodies depended on their denſity, or the bigneſs of their component particles. He alſo conſtructed a table, wherein the thickneſs of a plate neceſſary to reflect any particular colour was expreſſed in parts of an inch divided into 1,000,000 parts.

5
Colours by reflection.

Sir Iſaac Newton, purſuing his diſcoveries concerning the colours of thin ſubſtances, found that the ſame were alſo produced by plates of a conſiderable thickneſs. There is no glaſs or ſpeculum, he obſerves, how well poliſhed ſoever, but, beſides the light which it refracts or reflects regularly, ſcatters every way irregularly a faint light; by means of which the poliſhed ſurface, when illuminated in a dark room by a beam of the ſun's light, may eaſily be ſeen in all poſitions of the eye. It was with this ſcattered light that the colours in the following experiments were produced.

The ſun ſhining into his darkened chamber through a hole in the ſhutter one inch wide, he let the beam of light fall perpendicularly upon a glaſs ſpeculum concave on one ſide and convex on the other, ground to a ſphere of five feet eleven inches radius, and quickſilvered over on the convex ſide. Then, holding a quire of white paper at the centre of the ſphere to which the ſpeculums were ground, in ſuch a manner as that the beam of light might paſs through a little hole made in the middle of the paper, to the ſpeculum, and thence be refracted back to the ſame hole, he obſerved on the paper four or five concentric rings of colours like rainbows, ſurrounding the hole, very much like thoſe which appeared in the thin plates above-mentioned, but larger and fainter. Theſe rings, as they grew larger and larger, became more dilute, ſo that the fifth was hardly viſible; and yet ſometimes, when the ſun ſhone very clear, there appeared faint traces of a ſixth and ſeventh.

6
Colours by refraction and reflection enumerated.

We have already taken notice, that the thin plates made uſe of in the former experiments reflected ſome kinds of rays in particular parts, and tranſmitted others in the ſame parts. Hence the coloured rings appeared variouſly diſpoſed, according as they were viewed by tranſmitted or reflected light; that is, according as the plates were held up between the light and the eye, or not. For the better underſtanding of which we ſubjoin the following table, wherein on one ſide are mentioned the colours appearing on the plates by reflected light, and on the other thoſe which were oppoſite to them, and which became viſible when the glaſſes were held up between the eye and the window. We have already obſerved, that the centre, when the glaſſes were in full contact, was perfectly tranſparent. This ſpot, therefore, when viewed by reflected light, appeared black, becauſe it tranſmitted all the rays; and for the ſame reaſon it appeared white when viewed by tranſmitted light.

Colours by Reflected Light.	*Colours by Tranſmitted Light.*
Black	White
Blue	Yellowiſh-red
White	Black
Yellow	Violet
Red	Blue
Violet	White
Blue	Yellow
Green	Red
Yellow	Violet
Red	Blue
Purple	Green
Blue	Yellow
Green	Red
Yellow Red	Bluiſh-green
Green	Red
Red	Bluiſh-green
Greeniſh-blue	Red
Red	

The colours of the rings produced from reflection by the thick plates, followed the order of thoſe produced by tranſmiſſion through the thin ones; and by the analogy of their phenomena with thoſe produced from the thin plates, Sir Iſaac Newton concluded that they were produced in a ſimilar manner. For he found, that if the quickſilver was rubbed off from the back of the ſpeculum, the glaſs alone would produce the ſame rings, but much more faint than before; ſo that the phenomenon did not depend upon the quickſilver, except in as far as, by increaſing the reflection at the back of the glaſs, it increaſed the light of the coloured rings. He alſo found that a ſpeculum of metal only, produced none of theſe rings; which made him conclude, that they did not ariſe from one ſurface only, but depended on the two ſurfaces of the plate of glaſs of which the ſpeculum was made, and upon the thickneſs of the glaſs between them.

7 General theory of colours by Sir Iſaac Newton.

From theſe experiments and obſervations, it will be eaſy to underſtand the Newtonian theory of colours. Every ſubſtance in nature ſeems to be tranſparent, provided it is made ſufficiently thin. Gold, the moſt denſe ſubſtance we know, when reduced into thin leaves, tranſmits a bluiſh-green light through it. If, therefore, we ſuppoſe any body, gold, for inſtance, to be divided into a vaſt number of plates, ſo thin as to be almoſt perfectly tranſparent, it is evident that all or greateſt part of the rays will paſs through the upper plates, and when they loſe their force will be reflected from the under ones. They will then have the ſame number of plates to paſs through which they had penetrated before; and thus, according to the number of thoſe plates through which they are obliged to paſs, the object appears of this or that colour, juſt as the rings of colours appeared different in the experiment of the two plates, according to their diſtance from one another, or the thickneſs of the plate of air between them.

8 Mr Delaval's experiments in confirmation of it.

This theory is adopted by Edward Huſſey Delaval, in his Experimental Inquiry into the cauſe of the changes of colours in opaque and coloured bodies. He endeavours to confirm it by a number of experiments on the infuſions of flowers of different colours; but his ſtrongeſt arguments ſeem to be thoſe derived from the different tinges given to glaſs by metallic ſubſtances. Here he obſerves, that each metal gives a tinge according to its ſpecific denſity: The more denſe metals producing the leſs refrangible colours, and the lighter ones thoſe colours which are more eaſily refrangible. Gold, which is the denſeſt of all metals, imparts a red colour to glaſs, whenever it can be divided into particles ſo minute, that it is capable of being mixed with the materials of which glaſs is made. It ſeems indifferent by what means it is reduced to this ſtate, nor can it by any means be made to produce another colour. If it is mixed in large maſſes without being minutely divided, it imparts no colour to the glaſs, but remains in its metallic form. Lead, the metal whoſe denſity is next in order to that of gold, affords a glaſs of the colour of the hyacinth; a gem whoſe diſtinguiſhing characteriſtic is, that it is red with an admixture of yellow, the ſame colour which is uſually called *orange*. Glaſs of lead is mentioned by ſeveral authors as a compoſition proper, without the addition of any other ingredient, for imitating the hyacinth. Silver, next in denſity to lead, can only be made to communicate a yellow colour to glaſs. If the metal is calcined with ſulphur, it readily communicates this colour. Leaf-ſilver laid upon red hot glaſs, likewiſe tinges it yellow. When we meet with authors who mention a blue or greeniſh colour communicated by ſilver, the cauſe muſt have been, that the ſilver uſed in ſuch proceſſes was mixed with copper. Mr Delaval aſſures us, from his own experience, that ſilver purified by the teſt retains ſo much copper, that, when melted ſeveral times with nitre and borax, it always imparted a green colour at the firſt and ſecond melting: though afterwards no ſuch colour was obtainable from it. The only colour produced by copper is green. It is indifferent in what manner the copper is prepared in order to tinge the glaſs, provided it is expoſed without any other ingredient to a ſufficient degree of heat. If a quantity of ſalts are added in the preparation, they will, by attenuating the mixture, make the glaſs incline to blue, the colour next in order: but this happens only when the fire is moderate; for, in a greater degree of heat, the redundant ſalts, even thoſe of the moſt fixed nature, are expelled. It is true, that copper is mentioned by ſome writers as an ingredient in red glaſs and enamel: but the *red*, which is the colour of the metal not diſſolved or mixed with the glaſs, remains only while the compoſition is expoſed to ſuch a degree of heat as is too ſmall to melt and incorporate it; for if it be ſuffered to remain in the furnace a few minutes after the copper is added, the maſs will turn out green inſtead of red. Iron, the metal next in denſity to copper, is apt to be calcined, or reduced to a ruddy crocus, ſimilar to that ruſt which it contracts ſpontaneouſly in the air. In this ſtate, it requires a conſiderable degree of heat to diſſolve and incorporate it with glaſs : till that heat is applied, it retains its ruddy colour : by increaſing the heat, it paſſes through the intermediate colours, till it arrives at its permanent one, which is blue ; this being effected in the greateſt degree of heat the glaſs will bear, without loſing all colour whatever. Iron vitrified *per ſe* is converted into a blue glaſs. In ſhort, it is indubitable, that iron is the only metal which will, without any addition, impart to the glaſs a blue colour : for copper will not communicate that colour without the addition of a conſiderable quantity of ſalts, or ſome other matter that attenuates it ; and the other metals cannot by any means be made to produce it at all.

9
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ended by
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ey.

Theſe are the principal of Mr Delaval's arguments in favour of Sir Iſaac Newton's theory of colours being formed by denſity. Dr Prieſtley too hath mentioned ſome which deſerve attention. "It was a diſcovery of Sir Iſaac Newton (ſays he), that the colours of bodies depend upon the thickneſs of the fine plates which compoſe their ſurfaces. He hath ſhown, that a change of the thickneſs of theſe plates occaſions a change in the colour of the body ; rays of a different colour being thereby diſpoſed to be tranſmitted through it ; and conſequently rays of a different colour reflected at the ſame place, ſo as to repreſent an image of a different colour to the eye. A variation in the denſity occaſions a variation in the colour ; but ſtill a medium of any denſity will exhibit all the colours, according to the thickneſs of it. Theſe obſervations he confirmed by experiments on plates of air, water, and glaſs. He likewiſe mentions the colours which ariſe on poliſhed ſteel by heating it, as likewiſe on bell-metal, and ſome other metalline ſubſtances, when melted and poured on the ground, where they may cool in the open air ; and he aſcribes them to the ſcoriæ or vitrified parts of the metal, which, he ſays, moſt metals, when heated or melted, do continually protrude and ſend out to their ſurfaces, covering them in the form of a thin glaſſy ſkin. This great diſcovery concerning the colours of bodies depending on the thickneſs of the fine plates which compoſe their ſurfaces, of whatever denſity theſe plates may be, I have been ſo happy as to hit upon a method of illuſtrating and confirming by means of electrical exploſions. A number of theſe being received on the ſurface of any piece of metal, change the colour of it to a conſiderable diſtance from the ſpot on which they were diſcharged ; ſo that the whole circular ſpace is divided into a number of concentric rings, each of which conſiſts of all the priſmatic colours, and perhaps as vivid as they can be produced in any method whatever. Upon ſhowing theſe coloured rings to Mr Canton, I was agreeably ſurpriſed to find, that he had likewiſe produced all the priſmatic colours from all the metals, but by a different operation. He extended fine wires of all the different metals along the ſurfaces of pieces of glaſs, ivory, wood, &c. ; and when the wire was exploded, he always found them tinged with all the colours. They are not diſpoſed in ſo regular and beautiful a manner as in the rings I produced, but they equally demonſtrated that none of the metals thus exploded diſcovers the leaſt preference to one colour more than to another. In what manner theſe colours are formed it may not be eaſy to conjecture. In Mr Canton's method of producing them, the metal, or the calcined and vitrified parts of it, ſeem to be diſperſed in all directions from the plate of exploſion, in the form of ſpheres of a very great variety of ſizes, tinged with all the variety of colours, and ſome of them ſmaller than can be diſtinctly ſeen by any magnifier. In my method of making theſe colours, they ſeem to be produced in a manner ſimilar to the production of colours on ſteel and other metals by heat ; i. e. the ſurface is affected without the parts of it being removed from their places, certain plates or laminæ being formed of a thickneſs proper to exhibit the reſpective colours."

10
Iis experi-
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12
Newtonian
theory im-
pugned by
Dr Prieſt-
ley.

But, however well ſupported this doctrine of the formation of colours by denſity may be, we find the ſame author (Dr Prieſtley), whom we have juſt now ſeen arguing for it in his hiſtory of electricity, arguing againſt it in his hiſtory of viſion. "There are (ſays he) no optical experiments with which Sir Iſaac Newton ſeems to have taken more pains than thoſe relating to the rings of colours which appear in thin plates ; and in all his obſervations and inveſtigations concerning them, he diſcovers the greateſt ſagacity both as a philoſopher and mathematician ; and yet in no object to which he gave his attention, does he ſeem to have overlooked more important circumſtances in the appearances he obſerved, or to have been more miſtaken with regard to their cauſes. The former will be evident from the obſervations of thoſe who ſucceeded him in theſe inquiries, particularly thoſe of the Abbé Mazeas. This gentleman, endeavouring to give a very high poliſh to the flat ſide of an object-glaſs, happened to be rubbing it againſt another piece of flat and ſmooth glaſs ; when he was ſurpriſed to find, that after this friction, they adhered very firmly together, till at laſt he could not move the one above the other. But he was much more ſurpriſed to obſerve the ſame colours between theſe plane glaſſes that Newton obſerved between the convex object-glaſs of a teleſcope and another that is plane. Theſe colours between the plane glaſſes, the Abbé obſerves, were in proportion to their adheſion. The reſemblance between them and the colours produced by Newton, induced him to give a very particular attention to them ; and his obſervations and experiments were as follows :

13
Curious
experi-
ments by
the Abbé
Mazeas.

"If the ſurfaces of the pieces of glaſs are tranſparent, and well poliſhed, ſuch as are uſed for mirrors, and the preſſure be as equal as poſſible on every part of the two ſurfaces, a reſiſtance, he ſays, will ſoon be perceived when one of them is made to ſlide over the other ; ſometimes towards the middle, and ſometimes towards the edges ; but wherever the reſiſtance is felt, two or three very fine curve lines will be perceived, ſome of a pale red, and others of a faint green. Continuing the friction, theſe red and green lines increaſe in number at the place of contact, the colours being ſometimes mixed without any order, and ſometimes diſpoſed in a regular manner. In the laſt caſe, the coloured lines are generally concentric circles, or ellipſes, or rather ovals, more or leſs elongated as the ſurfaces are more or leſs united. Theſe figures will not fail to appear, if the glaſſes are well wiped and warmed before the friction.

"When the colours are formed, the glaſſes adhere with conſiderable force, and would always continue ſo without any change in the colours. In the centre of all thoſe ovals, the longer diameter of which generally exceeds ten lines, there appears a ſmall plate of the ſame figure, exactly like a plate of gold interpoſed between the glaſſes; and in the centre of it there is often a dark ſpot, which abſorbs all the rays of light except the violet: for this colour appears very vivid through a priſm.

"If the glaſſes are ſeparated ſuddenly, either by ſliding them horizontally over one another, or by the action of fire, as will be explained hereafter, the colours will appear immediately upon their being put together again, without the leaſt friction.

"Beginning by the ſlighteſt touch, and increaſing the preſſure by inſenſible degrees, there firſt appears an oval plate of a faint red, and in the midſt of it a ſpot of light green, which enlarges by the preſſure, and becomes a green oval, with a red ſpot in the centre; and this, enlarging in its turn, diſcovers a green ſpot in its centre. Thus the red and the green ſucceed one another in turns, aſſuming different ſhades, and having other colours mixed with them, which will be diſtinguiſhed preſently.

"The greateſt difference between theſe colours exhibited between plane ſurfaces and thoſe formed by curve ones is, that in the former caſe preſſure alone will not produce them, except in the caſe above mentioned. With whatever force he compreſſed them, his attempts to produce the colours were in vain without previous friction. But the reaſon of this plainly was, that with ſliding one of the glaſſes over the other, they could not be brought to approach near enough for the purpoſe.

"Having made theſe obſervations with plates of glaſs whoſe ſides were nearly parallel, he got two priſms with very ſmall refracting angles; and rubbing them together, when they were joined ſo as to form a parallelopiped, the colours appeared with a ſurpriſing luſtre at the places of contact, owing, he did not doubt, to the ſeparation of the rays of light by the priſm. In this caſe, differently coloured ovals appeared, but the plate of gold in them was much whiter, and only appeared yellow about its edges. The plate having a black ſpot in its centre, was bordered by a deep purple. He could not perceive any violet by his naked eye, but it might be perceived by the help of a lens with a weak light. It appeared in a very ſmall quantity at the confines of the purple and the blue, and ſeemed to him to be only a mixture of theſe two colours. It was very viſible in each of the coloured rings by inclining the glaſſes to the light of the moon. Next to the purple and violet appeared blue, orange, red tinged with purple, light green, and faint purple. The other rings appeared to the naked eye to conſiſt of nothing but faint reds and greens; and they were ſo ſhaded that it was not eaſy to mark their terminations. That the order of theſe may be compared with Newton's, he gives a view of both in the following table:

	Order of the Colours in the Plane Glaſſes.	*Order of the Colours in Newt. Object Glaſſes.*
Order I.	Black ſpot	Black
	Whitiſh oval	Blue
	Yellow border	White
	Deep purple.	Yellow
		Red
Order II.	Blue	Violet
	Orange	Blue
	Purple	Green
Order III.	Greeniſh blue	Yellow
	Yellow green	Red
	Purple red	Purple
		Blue
		Green
Order IV.	Green	Yellow
	Red	Red
Order V.	Faint green	Green
	Faint red	Red
Order VI.	Weak green	Greeniſh blue
	Light red	Red
Order VII.	Very faint green	Greeniſh blue
	Very faint red.	Red
		Greeniſh blue
		Pale red.

"When theſe coloured glaſſes were ſuſpended over the flame of a candle, the colours diſappeared ſuddenly, though the glaſſes ſtill continued to adhere to one another, when they were parallel to the horizon. When they were ſuffered to cool, the colours returned by degrees to their former places, in the order of the preceding table.

"After this the Abbé took two plates much thicker than the former, in order to obſerve at his leiſure the action of fire upon the matter which he ſuppoſed to produce the colours; and obſerved, that as they grew warm, the colours retired to the edges of the glaſſes, and there became narrower and narrower till they were reduced to imperceptible lines. Withdrawing the flame, they returned to their place. This experiment he continued till the glaſſes were bent by the violence of the heat. It was pleaſant, he ſays, to obſerve theſe colours glide over the ſurface of the glaſs as they were purſued by the flame.

"At the firſt our author had no doubt but that theſe colours were owing to a thin plate of air between the glaſſes, to which Newton has aſcribed them: but the remarkable difference in the circumſtances attending thoſe produced by the flat plates, and thoſe produced by the object-glaſſes of Newton, convinced him that the air was not the cauſe of this appearance. The colours of the flat plates vaniſhed at the approach of flame, but thoſe of the object-glaſſes did not. He even heated the latter till that which was next the flame was cracked by the heat, before he could obſerve the leaſt dilatation of the coloured rings. This difference was not owing to the plane glaſſes being leſs compreſſed than the convex ones; for though the former were compreſſed ever ſo much by a pair of forceps, it did not in the leaſt hinder the effect of the flame.

"Afterwards he put both the plane glaſſes and the convex ones into the receiver of an air pump, ſuſpending the former by a thread, and keeping the latter compreſſed

preſſed by two ſtrings; but he obſerved no change in the colours of either of them in the moſt perfect vacuum he could make.

"Notwithſtanding theſe experiments ſeemed to be concluſive againſt the hypotheſis of theſe colours being formed by a plate of air, the Abbé frankly acknowledges, that the air may adhere ſo obſtinately to the ſurface of the glaſſes as not to be ſeparated from them by the force of the pump; which, indeed, is agreeable to other appearances: but the following experiments of our author make it ſtill more improbable that the air ſhould be the cauſe of theſe colours.

"To try the utmoſt effect of heat upon theſe coloured plates, after warming them gradually, he laid them upon burning coals; but though they were nearly red, yet when he rubbed them together by means of an iron rod, he obſerved the ſame coloured circles and ovals as before. When he ceaſed to preſs upon them the colours ſeemed to vaniſh; but when he repeated the friction, they returned, and continued till the pieces of glaſs began to be red-hot, and their ſurfaces to be united by fuſion.

"When the outward ſurface of one of his plates of glaſs was quickſilvered, none of theſe colours were viſible, though the glaſſes continued to adhere with the ſame force. This he aſcribed to the ſtronger impreſſion made on the eye by the greater quantity of light reflected from the quickſilver.

"Judging from the reſemblance between his experiments and thoſe of Sir Iſaac Newton, that the colours were owing to the thickneſs of ſome matter, whatever that was, interpoſed between the glaſſes, the Abbé, in order to verify his hypotheſis, tried the experiment on thicker ſubſtances. He put between his glaſſes a little ball of ſuet, about a fourth of a line in diameter, and preſſed it between the two ſurfaces, warming them at the ſame time, in order to diſperſe the ſuet; but though he rubbed them together as before, and uſed other ſoft ſubſtances beſides ſuet, his endeavours to produce the colours had no effect. But, rubbing them with more violence in a circular manner, he was ſurpriſed on looking at a candle through them, to ſee it ſurrounded with two or three concentric rings, very broad, and with very lively delicate colours; namely, a red inclining to a yellow, and a green inclining to that of an emerald. At that time he obſerved only theſe two colours; but continuing the friction, the rings aſſumed the colours of blue, yellow, and violet, eſpecially when he looked through the glaſſes on bodies directly oppoſed to the ſun. If, after having rubbed the glaſſes, the thickneſs was conſiderably diminiſhed, the colours grew weaker by tranſmitted light, but they ſeemed to be much ſtronger by reflection, and to gain on one ſide what they loſt on the other.

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potheſis
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"Our author was confirmed in his opinion, that there muſt be ſome error in Newton's hypotheſis, by conſidering, that, according to his meaſures, the colours of the plates varied with the difference of a millionth part of an inch; whereas he was ſatiſfied that there muſt have been much greater differences in the diſtance between his glaſſes, when the colours remained unchanged.

"If the colour depended upon the thickneſs only, he thought that the matter interpoſed between the glaſſes ought to have given the ſame colour when it was reduced to a thin plate by ſimple fuſion as well as by friction, and that, in rubbing two plates together, warming them at different times, and compreſſing them with a conſiderable force, other colours would have appeared beſides thoſe above mentioned.

"Theſe circumſtances made him ſuſpect, that the different thickneſſes of the ſubſtance interpoſed between the glaſſes ſerved only to make them more or leſs tranſparent; which was an eſſential condition in the experiment; and he imagined that the friction diffuſed over the ſurface of the thin ſubſtance a kind of matter on which the colours are formed by reflected light; for when he held the plates (which gave the colours when the ſuet was between them) over the flame of a ſmall candle, the colours fled with great precipitation, and returned to their place without his being able to perceive the leaſt alteration in the ſuet.

"He was confirmed in his conjectures, by frequently obſerving, that when the glaſſes were ſeparated, at the moment the colours diſappeared, they were covered with the ſame greaſy matter, and that it ſeemed to be in the very ſame ſtate as when they were ſeparated without warming. Beſides, having often repeated the ſame experiment with different kinds of matter, he found that the degree of heat that diſperſed the colours was not always ſufficient to melt it; which difference was more ſenſible in proportion as the matter interpoſed was made thinner.

"Inſtead of the ſuet, he ſometimes made uſe of Spaniſh wax, reſin, common wax, and the ſediment of urine. He began with Spaniſh wax, on account of its remarkable tranſparency in Mr Haukſbee's electrical experiments; but he had much difficulty in making it ſufficiently thin by friction, being often obliged to warm his glaſſes, to ſeize the moment of fuſion, which continued but a ſhort time, and to hazard the burning of his fingers.

"The experiment at length ſucceeding, the Spaniſh wax appeared with its opacity and natural colour when it reflected the light, but they both diſappeared in the tranſmitted light. He obſerved the ſame rings in it as in the ſuet; and indeed he could perceive but little difference between the colour of ſuet, Spaniſh wax, common wax, or reſin; except that this laſt ſubſtance did not make the colours ſo vivid, on account of the too great tranſparency of its particles.

"The ſediment of urine had ſomething more particular in its appearance, as its colours were more lively. Holding it above the flame, its colour diſappeared; and keeping it in that ſituation, there were formed, upon its ſurface, ramifications, like thoſe of the hoar froſt, which diſappeared as the glaſſes grew cold. There were the ſame ramifications both upon the ſuet and the wax, but they were not ſo conſiderable. The glaſſes which had Spaniſh wax and reſin between them adhered with ſo much force, that they could not be ſeparated without the help of fire; and when they began to grow warm, they ſeparated with a noiſe like that of a glaſs breaking in the fire, though the glaſſes were not broken, and the matter between them was not melted

"Separating the glaſſes which he firſt uſed very ſuddenly, he obſerved upon their ſurface very thin vapours, which formed different colours, but preſently vaniſhed altogether.

“ To try the effect of vapour, he breathed upon one of his plates of glaſs, and obſerved that the vapours which adhered to the glaſſes ſometimes formed, before they were entirely diſperſed, a ſurpriſing variety of colours. This experiment, he obſerves, does not always ſucceed at the firſt trial. The glaſs muſt be breathed upon ſeveral times, and care muſt be taken to wipe it every time with one's hand, both to take off the moiſture, and alſo to make upon the glaſs a kind of furrows, which contribute very much to the variety of colours, by making inequalities in the thickneſſes of the vapours. It is neceſſary, alſo, that the glaſſes on which theſe experiments are made have no quickſilver upon them.

“ When the particles of water which formed this vapour were too thick to exhibit theſe colours, he ſtruck them ſeveral times with his pencil, in order to attenuate them; and then he ſaw an infinity of ſmall coloured threads which ſucceeded one another with great rapidity.

“ Putting a drop of water between two pieces of common glaſs, he obſerved that the compreſſion of them produced no colour; but if, while they were compreſſed, the water was made to paſs from one place to another, it left behind it large ſpots, red, yellow, green, purple, &c. and the ſpots aſſumed different colours with a ſurpriſing rapidity, and preſented to the eye a moſt beautiful variety of ſhades.

“ In order to determine with greater certainty whether they were vapours that cauſed the colours in his firſt obſervations, he firſt breathed upon one of his plates of glaſs, and then rubbed them againſt one another, when the colours appeared in the ſame order as before, but darker, and diſperſed in confuſion in the places occupied by the vapours: but when he made uſe of fire, to diſſipate the watery particles, the colours reſumed their luſtre.

“ Newton, having introduced a drop of water between his two object-glaſſes, obſerved, that in proportion as the water inſinuated itſelf between the glaſſes, the colours grew fainter, and the rings were contracted; and aſcribing theſe colours to the thickneſs of the plate of water, as he aſcribed the former to that of the plate of air, he meaſured the diameters of the coloured rings made by the plate of water, and concluded that the intervals between the glaſſes at the ſimilar rings of theſe two mediums were nearly as three to four; and thence he inferred, that in all caſes, theſe intervals would be as the ſines of the refractions of theſe mediums.

“ The Abbé Mazeas, in order to aſſure himſelf whether, agreeable to this rule, the coloured rings of his glaſſes depended upon the thickneſs of the water only, dipped one of the edges of his coloured glaſſes in a veſſel of water, having taken care to wipe and warm them well, before he produced his colours by friction. The water was a conſiderable time in riſing as high as the glaſſes; and in proportion as it aſcended, he perceived a very thin plate of water, which ſeemed to paſs over the matter which he thought produced the colours, without mixing with it; for beyond this plate of water, he ſtill perceived the colours in the ſame place and order, but deeper and darker; and holding the glaſſes above the flame of a candle, he ſaw the colours go and come ſeveral times as he moved them nearer to or farther from the flame. He then moiſtened both the glaſſes more than before; and rubbing them as uſual, he always ſaw the ſame appearance; and ſeizing the moment when the colours had diſappeared to ſeparate the glaſſes, he always found that they were wet. On this account, he thought that it could not be the water on which the colour depended, but ſome ſubſtance much more ſenſible to heat. He alſo thought that theſe coloured rings could not be owing to the compreſſion of the glaſſes; or that, if this circumſtance did contribute any thing to them, it ſerved rather to modify than to generate them.

15 M. du Tour's obſervations.

“ M. du Tour gave particular attention to the preceding obſervations of the Abbé Mazeas. He repeated the experiments with ſome variation of circumſtances, particularly comparing them with thoſe of Sir Iſaac Newton. He is ſo far from ſuppoſing a plate of air to be neceſſary to the formation of theſe coloured rings, that he thinks the reaſon of their not appearing between the flat plates of glaſs is the adhering of the air to their ſurfaces; and that mere preſſure is not ſufficient to expel it; except, as the Abbé Mazeas obſerved, the rings had before been made in the ſame place; in which caſe, ſimple appoſition without friction is ſufficient; the air, probably, not having had time to apply itſelf ſo cloſely to the ſurface of the glaſs. The contact of ſome other ſubſtances, M. du Tour obſerves, is not ſo prejudicial in this experiment as that of air; for he found, that, if he only gave the plates a ſlight coating of any kind of greaſe, the rings would appear without friction. Alſo dipping them ſlightly in water, or wiping them with his finger, would anſwer the ſame purpoſe. He verified his conjectures by means of the air-pump: for, dipping two pieces of glaſs in water, one of which had been wiped, and the other not, the former appeared to have no bubbles adhering to it when the air was exhauſted, whereas the other had.

“ When one of the glaſſes is convex, our author obſerves, that the particles of air may more eaſily make their eſcape by preſſure only; whereas their retreat is in a manner cut off when they are compreſſed between two flat ſurfaces. The air-pump, he found, was not able to detach theſe particles of air from the ſurfaces to which they adhere; leaving theſe flat plates for a conſiderable time in an exhauſted receiver, was not ſufficient to prepare them ſo well for the experiment as wiping them.

16 Experiments on colours by reflection.

“ Beſides the obſervations on the colours of thin plates, it has been ſeen that Sir Iſaac Newton imagined he could account for the colours exhibited by thick ones in ſome caſes in a ſimilar manner; particularly in thoſe curious experiments in which he admitted a beam of light through a hole in a piece of paſteboard, and obſerved the rings of colours reflected back upon it by a concave glaſs mirror of equal thickneſs in all places. Theſe experiments were reſumed, and happily purſued by the Duke de Chaulnes, who aſcribed theſe colours to the inflection of light*. Chance led the duke to obſerve, that when the nearer ſurface of the glaſs mirror was clouded by breathing upon it, ſo as lightly to tarniſh it, a white diffuſed and vivid light was ſeen upon the paſteboard, and all the colours of the rings became much ſtronger, and more diſtinct. This appearance he made conſtant by moiſtening the ſurface of the mirror with a little milk and water, and ſuffering it to dry upon it.

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* See Optics.

“ In all his experiments upon this ſubject, he found, that when the rays fell converging on the ſurface of the mirror, the rings were hardly viſible; when they fell parallel upon it, as they muſt have done in all the experiments of Newton, they appeared ſufficiently diſtinct; but when, by means of a convex lens placed in the hole of the window, they were made to diverge from the centre of the ſphere to which the mirror was ground, ſo that they fell perpendicularly on the ſurface of the mirror, the colours were as vivid as he could make them. In this caſe he could remove the reflected image to a great diſtance from the hole, without making the rings diſappear; and he could plainly perceive them to ariſe from their central ſpots, which changed their colours ſeveral times.

“ The effect of tarniſhing the mirror convinced him, that theſe coloured rings depended on the firſt ſurface of the mirror; and that the ſecond ſurface, or that which reflected them after they had paſſed the firſt, only ſerved to collect them and throw them upon the paſteboard in a quantity ſufficient to make them viſible; and he was confirmed in his ſuppoſition by the following experiments.

“ He took a plano-convex object-glaſs, of ſix feet focus, and placed it ſix feet from the paſteboard with its convex ſide towards it. By this means the rays which fell upon that ſurface, after being refracted there, were tranſmitted through the thickneſs of the glaſs, parallel to one another, and fell perpendicularly on the plane ſurface that reflected them, and, in their return, would be collected upon the paſteboard. In theſe circumſtances the rings appeared very diſtinct after he had tarniſhed the convex ſurface, which in this poſition was next to the light.

“ Turning the ſame glaſs the contrary way, ſo that the plane ſurface was towards the paſteboard, he could perceive none of the rings at the diſtance of ſix feet; but they were viſible at the diſtance of three feet; becauſe at that diſtance the ſecond ſurface reflected the rays by its concavity directly towards the paſteboard.

“ Theſe two experiments demonſtrate the uſe of the ſecond ſurface of the mirror, and ſhow the manner of placing it to moſt advantage. Thoſe that follow ſhow the uſe of the firſt ſurface with reſpect to theſe rings; and he was led to make them by the caſual obſervation above mentioned.

“ Newton, he obſerves, had remarked, that when he made uſe of a mirror of the ſame focus with the firſt he had uſed, but of twice the thickneſs, he found the diameter of the rings much ſmaller than before. This obſervation the duke thought favourable to his own concluſions; for if theſe rings depend upon the firſt ſurface, the nearer it is to the ſecond, which only reflects the ray tranſmitted from it, the larger they ought to appear upon the paſteboard.

“ To aſcertain this fact, he thought of making uſe of two moveable ſurfaces; and to make uſe of a micrometer to meaſure the diſtance between them with exactneſs. For this purpoſe he took a metallic mirror belonging to a reflecting teleſcope, being part of a ſphere of ten feet radius; and he fixed it firm upon a foot in which was a groove that carried a light frame, to which was faſtened a thin piece of talk tarniſhed with milk and water. The frame that ſupported the piece of talk could either be brought into contact with the mirror, or be removed to the diſtance of eight or nine inches from it, and the micrometer ſhowed to the utmoſt exactneſs the leaſt motion of the frame.

“ Having placed this mirror ten feet from the paſteboard, that is, at the diſtance of the radius of its own ſphere, he obſerved the rings to appear very diſtinct: the form of his mirror being very true: but the diameter of the rings upon the paſteboard varied with the diſtance of the talk from the mirror: ſo that they were very large when the talk was near the mirror, and very ſmall when it was placed at the diſtance of ſeven or eight inches.

“ Theſe experiments proved, that the rings were formed by the firſt ſurface, and reflected by the ſecond; but it ſtill remained to be determined in what manner they were formed. He imagined that the ſmall pencils of rays that were tranſmitted through the pores of the glaſs, or any other tranſparent ſubſtance, might ſuffer a kind of inflection, which might change the cylinder which they formed into a truncated cone, either by means of their different degrees of inflexibility, or by the different diſtances at which they paſs by the edges of the ſmall hole through which they are tranſmitted. Purſuing this idea, he thought of making uſe of ſome body, the pores of which were of a known and determined ſhape. Inſtead, therefore, of the piece of talk, he placed a piece of fine linen in the above-mentioned frame, ſtretching it as even as poſſible, to make the pores formed by the threads more exact, and more permeable by the light; and he ſoon found, with great pleaſure, that his conjecture was verified: for inſtead of the circular rings which he had before, they were now manifeſtly ſquare, though their angles were a little rounded; and they were coloured as the others, though the light was not very vivid, on account of the quantity that was ſtopped by the muſlin.

“ When, inſtead of the muſlin, he ſtretched acroſs his frame fine ſilver wires exactly parallel, at the diſtance of about three quarters of a line, or a whole line from one another, without any other wires acroſs them; inſtead of the rings which he had ſeen before, there was nothing upon the paſteboard but a gleam of white light, divided by many ſmall ſtreaks, coloured in a very vivid manner, and in the ſame manner as the rings.”

17
Another theory of colours.

Thus we have another hypotheſis of the formation of colours, namely, by the inflection of light in its paſſage out from between the ſolid and impenetrable particles of which bodies are compoſed. It is, however, very difficult, upon the hypotheſis either of Sir Iſaac Newton, or that of the duke de Chaulnes, to give a reaſon why bodies that are not entirely white, ſhould not appear variouſly coloured. For it appears from Sir Iſaac Newton's experiments, that plates of different denſity are capable of exhibiting the ſame colours; and that where a plate is continually varying in denſity, it will produce all the colours. Now it is evident, that the plates of which we ſuppoſe all natural bodies to be compoſed, muſt be ſimilar to one that is perpetually varying in its thickneſs; for ſuppoſing the plates of which any ſubſtance is compoſed to be of any determinate thickneſs, 9 millionth parts of an inch for inſtance; ſuch of the rays as are reflected from this plate will be red. But if any of them penetrate to the depth of 11$\frac{1}{6}$ of theſe parts, they will be reflected of a violet colour, &c. and thus muſt alloy and obſcure the red; and ſo of others. If we ſuppoſe the colours to be produced by inflection, it will be equally difficult to account for ſome particular rays being inflected and others not; ſeeing we obſerve that all of them are capable of being inflected by every ſubſtance whatever, when they paſs very near it. In ſome caſes, too, colours are produced when the light is neither refracted nor inflected, as far as we can judge; and this ſeems to obſcure the theory of chromatics more than any thing we have yet mentioned.

As the experiments we are now about to mention are of the greateſt importance, and in direct terms contradict one of Sir Iſaac Newton's, we ſhall give a full account of them, from Prieſtley's Hiſtory of Viſion, &c. with his remarks thereon.

18
One of Sir Iſaac Newton's experiments found to be erroneous.

The experiment in queſtion is the eighth of Newton's ſecond book of Optics: "He (Sir Iſaac Newton) found, he ſays, that when light goes out of air through ſeveral contiguous refracting mediums, as through water and glaſs, and thence goes out again into air, whether the refracting ſurfaces be parallel or inclined to one another, that light, as often as, by contrary refractions, it is ſo corrected, that it emerges in lines parallel to thoſe in which it was incident, continues ever after to be white; but if the emergent rays be inclined to the incident, the whiteneſs of the emerging light will, by degrees, in paſſing on from the place of emergence, become tinged at its edges with colours. This he tried by refracting light with priſms of glaſs, placed within a priſmatic veſſel of water.

"By theorems, deduced from this experiment, he infers, that the refraction of the rays of every ſort, made out of any medium into air, are known by having the refraction of the rays of any one ſort; and alſo, that the refraction out of one medium into another is found as often as we have the refractions out of them both into any third medium.

"On the contrary, a Swediſh philoſopher (M. Klingenſtierna) obſerves[*], that in this experiment, the rays of light, after paſſing through the water and the glaſs, though they come out parallel to the incident rays, will be coloured; but that the ſmaller the glaſs priſm is, the nearer will the reſult of it approach to Newton's deſcription.

"This paper of M. Klingenſtierna, being communicated to Mr Dollond by M. Mallet, made him entertain doubts concerning Newton's report of the reſult of his experiment, and determined him to have recourſe to experiments of his own.

"He therefore cemented together two plates of parallel glaſs, at their edges, ſo as to form a priſmatic veſſel when ſtopped at the ends or baſes; and the edge being turned downwards, he placed in it a glaſs priſm with one of its edges upwards, and filled up the vacancy with clear water; ſo that the refraction of the priſm was contrived to be contrary to that of the water, in order that a ray of light, tranſmitted through both theſe refracting mediums, might be affected by the difference only between the two refractions. As he found the water to refract more or leſs than the glaſs priſm, he diminiſhed or increaſed the angle between the glaſs plates, till he found the two contrary refractions to be equal, which he diſcovered by viewing an object through this double priſm. For when it appeared neither raiſed nor depreſſed, he was ſatisfied that the refractions were equal, and that the emergent rays were parallel to the incident.

"Now, according to the prevailing opinion, he obſerves, that the object ſhould have appeared through this double priſm in its natural colour; for if the difference of refrangibility had been in all reſpects equal, in the two equal refractions, they would have rectified each other. But this experiment fully proved the fallacy of the received opinion, by ſhowing the divergency of the light by the glaſs priſm to be almoſt double of that by the water; for the image of the object, though not at all refracted, was yet as much infected with priſmatic colours as though it had been ſeen through a glaſs wedge only whoſe angle was near 30 degrees.

19
Colours produced without refraction or reflection.

"This experiment is the very ſame with that of Sir Iſaac Newton above mentioned, notwithſtanding the reſult was ſo remarkably different: but Mr Dollond aſſures us, that he uſed all poſſible precaution and care in his proceſs; and he kept his apparatus by him, that he might evince the truth of what he wrote, whenever he ſhould be properly required to do it.

"He plainly ſaw, however, that if the refracting angle of the water-veſſel could have admitted of a ſufficient increaſe, the divergency of the coloured rays would have been greatly diminiſhed, or entirely rectified; and that there would have been a very great refraction without colour, as he had already produced a great diſcolouring without refraction; but the inconveniency of ſo large an angle as that of the priſmatic veſſel muſt have been, to bring the light to an equal divergency with that of the glaſs priſm, whoſe angle was about 60°, made it neceſſary to try ſome experiments of the ſame kind with ſmaller angles.

"Accordingly he got a wedge of plate-glaſs, the angle of which was only nine degrees; and, uſing it in the ſame circumſtances, he increaſed the angle of the water wedge, in which it was placed, till the divergency of the light by the water was equal to that by the glaſs; that is, till the image of the object, though conſiderably refracted by the exceſs of the refraction of the water, appeared nevertheleſs quite free from any colours proceeding from the different refrangibility of the light.

20
Defences Sir Iſaac.

"Notwithſtanding it evidently appeared, I may ſay to almoſt all philoſophers, that Mr Dollond had made a real diſcovery of ſomething not comprehended in the optical principles of Sir Iſaac Newton, it did not appear to ſo ſenſible a man, and ſo good a mathematician as Mr Murdoch is univerſally acknowledged to be. Upon this occaſion he interpoſed in the defence, as he imagined, of Sir Iſaac Newton; maintaining, that Mr Dollond's poſitions, which he ſays, he knows not by what miſhap have been deemed paradoxes in

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[*] Swed. Abhand. vol. xvi. p. 300.

Sir Iſaac's theory of light, are really the neceſſary conſequences of it. He alſo endeavours to ſhow, that Sir Iſaac might not be miſtaken in his account of the experiment above mentioned. But admitting all that he advances in this part of his defence, Newton muſt have made uſe of a priſm with a much ſmaller refracting angle than, from his own account of his experiments, we have any reaſon to believe he ever did make uſe of.

“ The fact probably was, that Sir Iſaac deceived himſelf in this caſe, by attending to what he imagined to be the clear conſequences of his other experiments; and though the light he ſaw was certainly tinged with colours, and he muſt have ſeen it to be ſo, yet he might imagine that this circumſtance aroſe from ſome imperfection in his priſms, or in the diſpoſition of them, which he did not think it worth his while to examine. It is alſo obſervable, that Sir Iſaac is not ſo particular in his deſcription of his priſms, and other parts of his apparatus, in his account of this experiment, as he generally is in other caſes, and therefore probably wrote his account of it from his memory only.

P. 804. “ Much has been ſaid on this experiment; and it is thought very extraordinary, that a man of Sir Iſaac's accurate attention ſhould have overlooked a circumſtance, the effect of which now appears to be ſo conſiderable. But it has happily occurred to Mr Mitchel, that, as Sir Iſaac Newton obſerves, he uſed to put ſaccharum ſaturni into his water to increaſe its refractive power, the lead, even in this form, might increaſe the diſſipative refraction, as it does in the compoſition of glaſs; and if ſo, that this would account for Newton's not finding his diſſipative power of water leſs than that of the glaſs priſms, which he otherwiſe ought to have done, if he had tried the experiment as he ſaid he did.

“ Accordingly he included a priſm of glaſs in water, as highly impregnated with ſaccharum ſaturni as it would bear, the proportion of ſaccharum to water being about as 5 to 11. When the image, ſeen through the water (ſo impregnated) and a glaſs priſm, was in its natural place, it ſtill was coloured, though very little: he thought not more than a fourth part as much as when ſeen through plain water, and the priſm in its natural place; ſo that he had no doubt, but that, if his priſm had had a little leſs of the diſperſing power, its errors would have been perfectly corrected.”

21
Mr Delaval's experiments on the colours of opaque bodies.

Beſides the experiments of Mr Delaval above related, and which were made on the colours of tranſparent bodies, he has lately publiſhed an account of ſome made upon the permanent colours of opaque ſubſtances; the diſcovery of which muſt be of the utmoſt conſequence in the arts of colour-making and dyeing. Theſe arts, he obſerves, were in very remote ages carried to the utmoſt height of perfection in the countries of Phœnicia, Egypt, Paleſtine, India, &c. and that the inhabitants of theſe countries alſo excelled in the art of imitating gems, and tinging glaſs and enamel of various colours. The colours uſed in very ancient paintings were as various as thoſe now in uſe, and greatly ſuperior both in beauty and durability. The paints uſed by Apelles were ſo bright, that he was obliged to glaze his pictures with a dark coloured varniſh, leſt the eye ſhould be offended by their exceſſive brightneſs; and even theſe were inferior to what had been uſed among the ancient Egyptians. Pliny complains that the art of painting was greatly decayed in his time; and the moderns were not furniſhed with any means of retrieving the art, until they began to avail themſelves of experimental obſervations.

22
Theſe colours depend chiefly on the diviſion of the colouring particles.

The changes of colour in permanently coloured bodies, our author obſerves, are produced by the ſame laws which take place in tranſparent colourleſs ſubſtances; and the experiments by which they can be inveſtigated conſiſt chiefly of various methods of uniting the colouring particles into larger, or dividing them into ſmaller maſſes. Sir Iſaac Newton made his experiments chiefly on tranſparent ſubſtances; and in the few places where he treats of others, acknowledges his deficiency of experiments. He makes the following remark, however, on thoſe bodies which reflect one kind of light and tranſmit another, viz. that “ If theſe glaſſes or liquors were ſo thick and maſſy that no light could get through them, he queſtioned whether they would not, like other opaque bodies, appear of one and the ſame colour in all poſitions of the eye; though he could not yet affirm it from experience.” It was the opinion of this great philoſopher, that all coloured matter reflects the rays of light, ſome reflecting the more refrangible, and others the leſs refrangible rays more copiouſly; and that this is not only a true reaſon of theſe colours, but likewiſe the only reaſon. He was likewiſe of opinion, that opaque bodies reflect the light from their interior ſurface by ſome power of the body evenly diffuſed over and external to it. With regard to tranſparent-coloured liquors, he expreſſes himſelf in the following manner: “ A tranſparent body, which looks of any colour by tranſmitted light, may alſo look of the ſame colour by reflected light; the light of that colour being reflected by the farther ſurface of that body, or by the air beyond it: and then the reflected colour will be diminiſhed, and perhaps ceaſe, by making the body very thick, and pitching it on the back ſide to diminiſh the reflection of its farther ſurface, ſo that the light reflected from the tinging particles may predominate. In ſuch caſes, the colour of the reflected light will be apt to vary from that of the light tranſmitted.”

To inveſtigate the truth of theſe opinions, Mr Delaval entered upon a courſe of experiments with tranſparent coloured liquors and glaſſes, as well as with opaque and ſemi-tranſparent bodies. From theſe he diſcovered ſeveral remarkable properties of the colouring matter; particularly, that in tranſparent coloured ſubſtances it does not reflect any light; and when, by intercepting the light which was tranſmitted, it is hindered from paſſing through ſuch ſubſtances, they do not vary from their former colour to any other, but become entirely black (A).

This incapacity of the colouring particles of tranſparent

(A) Here our author obſerves, that he makes uſe of the world *colour* only to expreſs thoſe called *primary*;

23 No light reflected by the colouring particles.

parent bodies to reflect light, being deduced from very numerous experiments, may therefore be held as a general law. It will appear the more extenſive, if we conſider, that, for the moſt part, the tinging particles of liquors or other tranſparent ſubſtances are extracted from opaque bodies; that the opaque bodies owe their colours to thoſe particles, in like manner as the tranſparent ſubſtances do; and that by the loſs of them they are deprived of their colours.

24 Apparatus for making theſe experiments.

For making his experiments, Mr Delaval uſed ſmall phials of flint-glaſs, whoſe form was a parallelopiped, and their height, excluſive of the neck, about two inches, the baſe about an inch ſquare, and the neck two inches in length. The bottom and three ſides of each of theſe phials were covered with a black varniſh; the cylindrical neck, and the anterior ſide, except at its edges, being left uncovered. He was careful to avoid any crevices in the varniſh, that no light might be admitted except through the neck or anterior ſide of the phials.

In theſe experiments it is of importance to have the phials perfectly clean; and as many of the liquors are apt to depoſit a ſediment, they ought to be put into the phials only at the time the experiments are to be made. The uncovered ſide of the phials ſhould not be placed oppoſite to the window through which the light is admitted; becauſe in that ſituation the light would be reflected from the farther ſide of the phial; and our author obſerves, that ſmooth black ſubſtances reflect light very powerfully. But as it is a principal object in the experiment, that no light be tranſmitted through the liquor, this is beſt accompliſhed by placing the uncovered ſide of the phial in ſuch a ſituation that it may form a right angle with the window.

25 The colouring matter only ſhows itſelf by tranſmitted light.

With theſe precautions, our author viewed a great number of ſolutions, both of coloured metallic ſalts and of the tinging matter of vegetables; univerſally obſerving, that the colour by reflection was black, whatever it might be when viewed by tranſmitted light. If theſe liquors, however, are ſpread thin upon any white ground, they appear of the ſame colour as when viewed by tranſmitted light; but on a black ground they afford no colour, unleſs the black body be poliſhed; in which caſe the reflection of the light through it produces the ſame effect as tranſmiſſion.

The experiments with tinged glaſſes were in many reſpects analogous to thoſe with tranſparent-coloured liquors. For theſe he made ſeveral parcels of colourleſs glaſſes, principally uſing one compoſed of equal parts of borax and white ſand. The glaſs was reduced to powder, and afterwards ground, together with the ingredients by which the colours were imparted. "This method (ſays he) of incorporating the tinging particles is greatly preferable to mixing them with the raw materials; and the glaſſes thus compoſed excel moſt others in hardneſs, being ſcarcely inferior in luſtre to real gems."

The reſult of all the experiments made in this manner was, that when matter is of ſuch thinneſs, and the tinge ſo diluted, that light can be tranſmitted through it, the glaſſes then appear vividly coloured; but when they are in larger maſſes, and the tinging matter is more denſely diffuſed through them, they appear black; for theſe, as well as the tranſparent coloured liquors, ſhow their colour by tranſmiſſion. The following experiments were made with a view to determine the proportion of tinging matter which produces colour or blackneſs.

26 Experiments to determine the proportion of tinging matter.

1. Glaſs was tinged green by adding to it $\frac{1}{60}$th of its weight of copper; and that whether the latter was uſed in its metallic or calcined ſtate.

2. A blue glaſs was made by the addition of zaffre, a purple one by mangneſe, a red glaſs by gold, and yellow glaſſes by ſilver and calcined iron. A yellow glaſs reſembling a topaz was likewiſe made by the addition of a ſmall quantity of charcoal in powder. The ſame colour was likewiſe procured by the addition of wheat-flour, roſin, and ſeveral other inflammable matters. Small pieces of each of theſe glaſſes being ground by a lapidary, reſembled gems of their different colours.

3. Having formed pieces of ſuch glaſſes about two inches thick, he incloſed them in black cloth on all ſides, except their farther and anterior ſurfaces. In this ſituation each of them ſhowed a vivid colour when light was tranſmitted through them; but when the poſterior ſurface was likewiſe covered with the cloth to prevent this tranſmiſſion, no other colour than black was exhibited by any of them.

4. When plates of tranſparent-coloured glaſs, ſomewhat thicker than common window-glaſs, were made uſe of, they always exhibited their colours by tranſmitted light.

5. On intercepting the light tranſmitted through theſe coloured plates, they as conſtantly appeared black when placed in ſuch a direction as to form a right angle with the window.

From theſe phenomena Mr Delaval deduced the following obſervations: 1. That the colouring particles do not reflect any light. 2. That a medium, ſuch as Sir Iſaac Newton has deſcribed, is diffuſed over both the anterior and farther ſurfaces of the plates, whereby objects are equally and regularly reflected as by a mirror. Hence, when it is ſaid that light is reflected by the ſurface of any ſubſtance, it ſhould be underſtood from this expreſſion, that the reflection is effected by the medium diffuſed over its ſurface.

27 On the reflection of the light of a candle by coloured glaſſes.

6. When a lighted candle is placed near one of thoſe coloured plates, the flame is reflected by the medium which is diffuſed over the anterior ſurface. The image thus reflected entirely reſembles the flame in ſize and colour; being ſcarcely diminiſhed, and not in the leaſt tinged by the coloured glaſs.

7. If the plate be not ſo intenſely coloured, or ſo maſſy, as to hinder the tranſmiſſion of the light of the candle, there appears a ſecondary image of the flame, which is reflected by the medium contiguous to the farther ſurface of the glaſs; and as the light thus reflected paſſes through the coloured glaſs, it is tinged very vividly.

8. When

ſuch a mixture of them as does not compoſe whiteneſs, or any of the gradations between white and black; ſuch as are called by Sir Iſaac Newton, gray, dun, or ruſſet brown.

8. When the glaſs uſed in this experiment is of a green colour, the image of the flame is always of a bright green; and when glaſſes of other colours are uſed, that of the ſecondary flame is always the ſame with that of the glaſs.

9. The ſecondary image is leſs than that reflected from the anterior ſurface. This diminution is occaſioned by the loſs of that part of the light which is abſorbed in paſſing through the coloured glaſs. For whenever any medium tranſmits one ſort of rays more copiouſly than the reſt, it ſtops a great part of the differently coloured rays. Much more light alſo is loſt in paſſing through coloured than tranſparent ſubſtances. In making theſe obſervations, it is proper to chooſe coloured plates of glaſs which are not in every part of an equal thickneſs, that the ſecondary image may not coincide with that reflected from the anterior ſurface, and be intercepted by it.

10. When the plates are ſo thick, and ſo copiouſly coloured, that the light cannot penetrate to their farther ſurface, they appear intenſely black in whatever direction they are viewed, and afford no ſecondary image, but only reflect, from their anterior ſurface, the flame, or any other objects that are oppoſed to them. Theſe objects are repreſented in their own proper colours, and are as free from tinge as thoſe reflected from quickſilvered glaſs, or ſpecula made of white metals.

Hence again it is manifeſt, that the colouring particles do not poſſeſs any ſhare of reflective power; for if they had any ſhare in this reflection, they would certainly impart ſome ſhare of colour to the light they reflected. Hence alſo it appears, that tranſparent coloured bodies, in a ſolid ſtate, poſſeſs no more reflective power than thoſe in a fluid ſtate.

28 Experiments on the pure colouring particles.

Our author next conſiders the colouring particles themſelves, pure, and unmixed with other media. In order to procure maſſes made up of ſuch particles, ſeveral tranſparent coloured liquors were reduced to a ſolid conſiſtence by evaporation. By employing a gentle heat, the colouring matter may thus remain unimpaired; and is capable of having its particles again ſeparated by water or other liquids, and tinging them as before.

In this ſtate the colouring particles reflect no light, and therefore appear uniformly black, whatever ſubſtance they have been extracted from. In the courſe of his experiments, Mr Delaval made uſe of the infuſions of brazil wood, logwood, fuſtic, turmeric, red ſaunders, alkanet, ſap-green, kermes, and all the other tranſparent coloured liquors he had tried before, among which were infuſions of red and yellow flowers, without obſerving the leaſt variation in the reſult.

Some liquors are apt to become totally opaque by evaporation; the reaſon of which may be the cryſtallization of ſaline matters, or the coaleſcence of the particles into maſſes, differing conſiderably in denſity from the menſtrua in which they were diſſolved. When this opacity takes place, our author has conſtantly obſerved, that they became incapable of entering the pores of wool, ſilk, or other matters of that kind, or of adhering to their ſurface; and conſequently unfit for the purpoſes of dyeing. This he ſuppoſes to ariſe from their increaſed bulk; for the attractive force by which the particles cohere together is weakened in proportion as their bulk increaſes; ſo that the degree of magnitude of the colouring particles, which is eſſential to the capacity of liquors, is inconſiſtent with the minuteneſs requiſite for dyeing. An inſtance of this is given in an infuſion of fuſtic. Having infuſed ſome of this wood in ſuch a quantity of water, that the latter was ſaturated with the colouring particles, he evaporated the liquor to a ſolid conſiſtence with an uninterrupted, but very gentle heat. During every part of the proceſs the liquor continued tranſparent, and the ſolid extract yielded by it tranſmitted a yellow colour when ſpread thin, but appeared black when thicker maſſes were viewed. Having prepared another pint of this liquor, he evaporated half the water, and allowed the remainder to become cold. In this ſtate it became turbid and opaque; on filtering, a tranſparent tincture paſſed through, an opaque fecula remaining on the paper. This fecula did not adhere to the paper, but was eaſily ſeparable from it: on being dried, it appeared white with a ſlight tinge of yellow; but was nevertheleſs ſoluble in water, and by ſolution gave a liquid in all reſpects ſimilar to the original infuſion. "From theſe circumſtances (ſays he) it appears that a given proportion of water, or a ſufficient degree of heat, is requiſite to the ſolution of the colouring particles of fuſtic. And experience evinces, that thoſe particles which are too groſs to paſs through filtering paper, are incapable of entering the pores, or firmly cohering to the ſurface of bodies. Many ingredients, ſuch as the colouring particles of logwood, kermes, and various other matters, are ſoluble in water in every proportion; and therefore their infuſions are not ſubject to become opaque or turbid during their evaporation. The ſolid extracts obtained by evaporation reflect no colour, but are black.

Our author alſo formed ſolid maſſes by mixing a ſmall quantity of drying oil with pigments which conſiſt chiefly of colouring matter; as Pruſſian blue, indigo, and ſap green. Theſe paints likewiſe exhibit their reſpective colours only by tranſmitted light, appearing entirely black when viewed by reflection. Inſtances of blackneſs ariſing from this denſity of the colouring matter, may be obſerved in ſeveral kinds of fruits, as black currants, cherries, &c. for the juices of theſe appear red when ſpread thin on a white ground, or otherwiſe viewed by tranſmitted light.

Mr Delaval's next attempt was to conſider the action and properties of the colouring particles of opaque bodies themſelves, and the means by which theſe colours are produced. Here our author endeavours to prove, that theſe colours of opaque bodies appear on the ſame principles as thoſe already mentioned, which ſeem black when very denſe, but ſhow their proper tinge when ſpread thin upon a white ground. On this ſubject the following experiments were made:

1. Graſs, and other green leaves of plants, were digeſted in rectified ſpirit of wine; by which means a tranſparent green tincture was obtained. One of the vials formerly mentioned being filled with this liquid, it was obſerved to tranſmit a vivid green colour; but the other part of the tincture, which was contiguous to the uncovered ſide of the vial, reflected no light, and therefore appeared black.

2. Having poured ſome of the tincture into a China cup, the bottom was thereby made to look green, ex-

actly reſembling the colour which had been extracted from the leaves.

3. After the colour had been totally abſtracted by the vinous ſpirit, the leaves remained apparently unaltered, either as to figure or texture; but were entirely white, or had their whiteneſs ſlightly tinged with brown.

4. Red, purple, and blue flowers, were alſo digeſted in ſpirit of wine, all of which yielded their colouring matter to the ſpirit, and became white by being deprived of it. From moſt of theſe flowers, however, the ſpirit acquired either no tinge at all, or only a very faint one; but when acidulated, it became red, and by the addition of an alkali appeared blue, purple, or green, according to the quantity of alkali, and the nature of the infuſion. In theſe ſtates, all of them, when viewed by tranſmitted light, or poured upon a white ground, ſhowed their colours, but univerſally appeared black by reflection.

5. Red, purple, and blue flowers, were digeſted in water ſlightly acidulated with nitrous acid. Thus, red infuſions were obtained, which, by ſaturation with ſea-ſalt, might be preſerved for many years.

6. The ſame liquors were changed green, blue, or purple, by the addition of an alkali: but here the caſe was the ſame as before; all of them yielding vivid colours by tranſmiſſion, but none by reflection. In making this experiment, care muſt be taken to add the alkali very gradually; for if too much is put in at once to the red liquor, the immediate colours between the red and the green will be wanting. To half an ounce of the red infuſion it is proper to add, at once, only the ſmalleſt quantity that can be taken upon the point of a pen; repeating this addition ſlowly, until each of the colours be produced.

7. The flowers, after having been repeatedly macerated in acidulated water, loſt their colouring matter, and became white.

8. Yellow flowers alſo communicated their colours to water and to ſpirit of wine. The infuſions and tinctures of theſe flowers were ſubjected to the ſame experiments as had been employed in the examination of the liquors already mentioned; and appeared yellow by tranſmitted light, but did not reflect any colour.

9. White paper, linen, &c. may be tinged of any of theſe colours, by dipping them in the infuſions; and the conſideration of the manner in which the colours are imparted to the linen, affords much inſight into the manner in which natural colours are produced. It has already been obſerved, that, when the colouring matter of plants is extracted from them, the ſolid fibrous parts, thus diveſted of their covering, diſplay their natural whiteneſs. White linen, paper, &c. are formed of ſuch fibrous vegetable matter; which is bleached by diſſolving and detaching the heterogeneous colouring particles. When theſe are dyed or painted with vegetable colours, it is evident that they do not differ in their manner of acting on the rays of light from natural vegetable bodies; both yielding their colours by tranſmitting, through the tranſparent coloured matter, the light which is reflected from the white ground. This white matter frequently exiſts, without any conſiderable mixture, in plants, while they are in a ſtate of vegetation; as cotton, white flowers, the pith, wood, ſeeds, roots, and other parts of ſeveral kinds of vegetables. When decayed trees, &c. have been long expoſed to the atmoſphere, their coloured juices are ſometimes ſo perfectly extracted, that the fibres appear white. This white matter is not diſtinct from the vegetable earth to which plants are reduced by burning. Mr Delaval has rendered aſhes intenſely white, by carefully calcining them, and afterwards grinding with a ſmall proportion of nitre, and expoſing them to ſuch a degree of heat as would cauſe the nitre deflagrate with the remaining quantity of phlogiſton. Laſtly, the aſhes were digeſted with muriatic acid, in order to diſſolve the ferruginous matter diffuſed through them, and repeatedly waſhing the remainder in water. Mixing aſhes thus purified with borax, and applying a vitrifying heat, an opaque enamel is obtained, remarkable for its whiteneſs.

29
How aſhe
may be
made intenſely
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30
White
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Hence it appears, that the earth which forms the ſubſtance of plants is white, and ſeparable from that ſubſtance which gives to earth its peculiar colour; that whenever it is pure and unmixed, or diffuſed through colourleſs media, it ſhows its native whiteneſs; and is the only vegetable matter endowed with a reflective power. It may be diſcovered, however, by other means than that of burning: thus, roſes may be whitened by expoſing them to the vapour of burning ſulphur; an effect which cannot be attributed to the ſulphuric acid, but to the phlogiſton contained in that vapour. This was proved to be the caſe, by expoſing ſeveral kinds of red and purple flowers to the phlogiſtic vapour iſſuing from hepar ſulphuris; and by this every one of them was whitened; their colour being afterwards reſtored by the addition of an acid either mineral or vegetable.

31
Colouring
matter diſ-
ſolved by
carbonic
acid.

"Thus (ſays Mr Delaval) it appears, that the colouring matter of the flowers is not diſcharged or removed, but only diſſolved by carbonic acid; and thereby divided into particles too minute to exhibit any colour. In this ſtate, together with the vegetable juice in which they are diffuſed, they form a colourleſs tranſparent covering, through which the white matter of the flowers is ſeen untinged. The colouring particles of plants conſiſt principally of inflammable matter, and their ſolubility in carbonic acid, and union with it, are analogous to the action of other inflammable bodies upon each other. Thus, æther diſſolves all eſſential and expreſſed oils, animal empyreumatic oils, and reſins. Sulphur, camphor, and almoſt all ſubſtances abounding in phlogiſton, are ſoluble in oils, ardent ſpirits, or other inflammable menſtrua. The manner in which the red colour of vegetable flowers is reſtored, appears to be explicable from known chemical laws. When acids are applied to the whitened flowers, they unite with the phlogiſton which the ſulphur had communicated, and diſengage it from the colouring particles; which, being thus extricated, reſume their original magnitude and hue. A change of the ſame kind is alſo produced by fixed alkali, which, like the acids, has a ſtrong attraction for phlogiſton, always changes the whitened flowers to a blue, purple, or green colour.

32
Colours d
ſtroyed by
the light o
the ſun.

"In like manner, the action of the rays of light operates upon coloured bodies. Thus, dyed ſilk, or other ſubſtances of that kind, when expoſed to the ſun's light, are deprived of their colour in every part on which the rays are allowed to act; whilſt thoſe preſerve their colour which are defended from the light by the folds of the cloth, or intervention of any opaque body. The colours thus impaired, may be reſtored, if acids are applied while the injury is recent; but they are afterwards apt to fly off, on account of that volatility which is conſtantly imparted by inflammable matter to any other with which it is united."

Our author now proceeds, at conſiderable length, to prove the identity of the ſolar light and carbonic acid; but as recent experiments have ſhown that theſe two are eſſentially diſtinct, we omit his argumentation upon this head. The error of his theory in this reſpect, however, does not in the leaſt affect the doctrine concerning colours above laid down: on the contrary, the lateſt experiments have determined, that carbonic acid in its groſſeſt form, viz. that of common charcoal, manifeſts a ſurpriſing power of whitening various ſubſtances; which, according to Mr Delaval's theory, proceeds from the power it has of diſſolving the colouring matter with which they are impregnated. This ſolvent power, according to our author, is manifeſt in many other inſtances beſides thoſe already mentioned. Silk is whitened by the carbonated vapours of ſulphur; and this operation does not appear to differ from the change effected on flowers by the ſame vapour. The light of the ſun is found to be a neceſſary and eſſential agent in bleaching linen, wax, and various other ſubſtances; ſome part of the colouring matter which impairs the whiteneſs of theſe bodies not yielding to any other ſolvent. Red flowers are whitened by the electric ſpark, of whoſe inflammable nature we cannot entertain the leaſt doubt; for the ſpark itſelf is a bright flame, and yields the ſame ſmell which all other carbonated matters impart. The electric ſpark, in like manner, changes the blue infuſion of turnſole to red (B). The effects which it produces on the turnſole, and on red flowers, do not differ from each other, except in degree only. For when vegetable matter is diſſolved, it is changed from blue to red; and, when farther diſſolved, it is divided into particles too minute to exhibit any colour.

33 How to ditinguiſh he ſolutions made by carbone rom thoſe made by acids.

Solutions effected by means of phlogiſton frequently are wrongly attributed to the operation of ſuppoſed acid menſtrua, as ſeveral kinds of ſubſtances are capable of being diſſolved indiſcriminately both by acids and phlogiſton. For the purpoſe of diſtinguiſhing, therefore, in any caſe between the action of the acid ſolvents and that of the inflammable menſtrua, it is proper to examine the nature of the matter by which either of theſe principles are furniſhed. It appears from various chemical proceſſes, that alkalies are rendered mild, and capable of cryſtallization, in proportion as they are united to carbone. The carbonated alkaline lixivium, when ſaturated, is perfectly mild; and by a ſlight evaporation is reduced to a concrete cryſtalline maſs, which does not deliqueſce or imbibe the leaſt moiſture from the air, and no longer retains any alkaline property. M. Beaume, by an elegant and ingenious experiment, has proved the preſence of carbone in mild alkalies, and has ſhown that their power of cryſtallizing depends on their union with that principle. He heated in a ſilver veſſel a lixivium of mild alkali, which imparted to the ſilver a covering or coating of inflammable matter, by which its ſurface was tarniſhed and became black. The lixivium was ſeveral times poured out of the ſilver veſſel, and after the ſurface of the metal had been freed from the tarniſh, the lixivium was replaced in it, and again heated, by which the tarniſh was renewed; and this was repeated till the lixivium no longer communicated any ſtain to the ſilver. The cauſticity of the lixivium was increaſed in proportion as it imparted its carbone to the ſilver; and at the end of the proceſs the alkali became perfectly cauſtic and incapable of cryſtallizing.

"From the preceding experiments (ſays he) it appears, that the colouring particles of flowers and leaves are ſoluble in acid, alkaline, and carbonated menſtrua. The other parts of vegetables conſiſt of materials ſimilar to thoſe which are contained in their flowers and leaves, and undergo the ſame changes from the ſame cauſes. Having extracted from logwood its colouring particles by repeadly boiling it in water, the wood was thus deprived of its yellow colour, and aſſumed a brown hue ſimilar to that of oak-wood. Some pieces of it thus deprived of its colour were then macerated in nitric acid; and after they had undergone the action of that acid, they were waſhed in a ſufficient quantity of water. The wood was thus reduced to whiteneſs."

34 Logwood affords only a yellow tincture with water.

Here our author obſerves, that though moſt authors who treat of colouring ſubſtances deſcribe logwood as of a red colour, he was never able to procure any other colour from it than yellow. It imparts yellow and orange colours to diſtilled water. Other waters extract a red tinge from it by means of the alkali which they contain. Theſe obſervations are alſo applicable to the other dyeing woods, kermes, and various other articles of the materia tinctoria. By a ſimilar treatment, fuſtic wood alſo loſt its colouring matter, and became white.

The reſults of all the experiments above related are, that the colouring matter of plants does not exhibit any colour by reflection, but by tranſmiſſion only; that their ſolid earthy ſubſtance is a white matter; and that it is the only part of vegetables which is endowed with a reflective power; that the colours of vegetables are produced by the light reflected from this white matter, and tranſmitted from thence through the coloured coat or covering which is formed on its ſurface by the colouring particles; that whenever the colouring matter is either diſcharged or divided by ſolution into particles too minute to exhibit any colour, the ſolid earthy ſubſtance is expoſed to view, and diſplays that whiteneſs which is its diſtinguiſhing characteriſtic.

35 Colouring matter of animal ſubſtances.

Mr Delaval next proceeds to examine the coloured parts of animal ſubſtances, and finds them exactly ſimilar, with regard to the manner in which the colour is

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(B) This effect of the electric ſpark is now known to be produced, not by its carbonated nature, but by the generation of an acid.

is produced, to the vegetable bodies already treated of. The tinctures and infuſions of cochineal and of kermes yield their colours when light is tranſmitted through them, but ſhow none by reflection. On diluting freſh ox-gall with water, and examining it in the phials already mentioned, that part of it which was in the neck of the phial, and viewed by tranſmitted light, was yellow; but the anterior ſurface was black and reflected no colour. Fleſh derives its colour entirely from the blood, and when deprived of it, the fibres and veſſels are perfectly white; as are likewiſe the membranes, ſinews, and bones, when freed from their aqueous and volatile parts; in which caſe they are a mere earth, unalterable by fire, and capable of imparting an opaque whiteneſs to glaſs.

36 Of the colour of blood.

On examining blood diluted with water in one of the phials formerly deſcribed, it tranſmitted a red colour, and the anterior ſurface was almoſt, but not entirely, black; for it received a ſlight hue of brown from ſome coagulated particles that were ſuſpended in the liquor. In order to procure blood ſufficiently diluted, and at the ſame time equably and perfectly diſſolved, he mixed as much cruor with ſpirit of ſal ammoniac as imparted a bright colour to it. The liquor being then viewed in the phial, that part which was contained in the neck, and tranſmitted the light, appeared of a fine red; but the anterior part reflecting no light, was intenſely black. Hence it appears, that the florid red colour of the fleſh ariſes from the light which is reflected from the white fibrous ſubſtance, and tranſmitted back through the red tranſparent covering which the blood forms on every part of it.

Blood, when recently drawn, does not aſſume the appearance common to tranſparent coloured liquors; for theſe, when too maſſy to tranſmit light from their farther ſurfaces, always appear black; but blood, when recently drawn, always ſhows a fine red colour, in whatever way it be viewed. This is occaſioned by a white matter diffuſed through the blood; and which is eaſily ſeparated from the cruor, by dividing it after coagulation into a number of thin pieces, and waſhing in a ſufficient quantity of pure water. Thus the water acquires a red colour, and ought to be changed daily. In a few days it will acquire no more tinge; and the remaining maſſes of the cruor are no longer red, but white.

37 Of the ſhells of lobſters.

In like manner, the red colour of the ſhells of lobſters, after boiling, is no more than a mere ſuperficial covering ſpread over the white calcareous earth of which the ſhells are compoſed, and may be eaſily removed from the ſurface by ſcraping or filing. Before the application of heat, this ſuperficial covering is much denſer, inſomuch that, in ſome parts of the ſhell, it appears quite black, being too thick to admit the paſſage of the light to the ſhell and back again; but where this tranſparent blue colour of the unboiled lobſter is thinner, it conſtantly appears like a blue film. In like manner, the colours of the eggs of certain birds are entirely ſuperficial, and may be ſcraped off, leaving the white calcareous earth expoſed to view.

38 Of feathers.

The caſe is the ſame with feathers, which owe their colours entirely to a very thin layer of ſome tranſparent mater upon a white ground. Our author aſcertained this by ſcraping off the ſuperficial colours from certain feathers which were ſtrong enough to bear the operation; and thus ſeparated the coloured layers from the white ground on which they had been naturally ſpread. The lateral fibres of the feathers cannot indeed have their ſurfaces ſeparated in this manner; but their texture, when viewed by a microſcope, ſeems to indicate, that the colours are produced upon them by no other means than thoſe already related. In the examination of ſome animal ſubjects, where the colouring matter could not be ſeparated by chemical means, our author had recourſe to mechanical diviſion; but this can only be employed when the principal part of the white ſubſtance is unmixed with the coloured coat or covering which is ſpread upon its ſurface. All of them, however, by whatever means their colours could be ſeparated, ſhowed that they were produced in the ſame manner, namely, by the tranſmiſſion of light from a white ground through a tranſparent coloured medium.

39 Of the colours of mineral ſubſtances.

The coloured ſubſtances of the mineral kingdom are very numerous, and belong principally to two claſſes, viz. earths and metals. The former, when pure, are all perfectly white, and their colours ariſe from carbonic or metallic mixtures. Calcareous earths, when indurated, conſtitute marble, and may be tinged with various colours by means of metallic ſolutions: all which are ſimilar in their nature to the dyes put upon ſilk, cotton, or linen, and invariably proceed from the ſame cauſe, viz. the tranſmiſſion of light through a very thin and tranſparent coloured medium. Flints are formed from ſiliceous earths, and owe their colour to carbone. When ſufficiently heated, they are rendered white by the loſs of the inflammable matter which produced their colour. When impregnated with metals, they form agates, cornelians, jaſper, and coloured cryſtals. The coloured gems alſo receive their different hues from metals; and all of them may be imitated by glaſſes tinged with ſuch carbonic or metallic matters as enter into the compoſition of the original ſubſtances.

40 Of metals.

Thus our author concludes, that the coloured earths, gems, &c. exhibit their various tints in the ſame manner with other ſubſtances; viz. by the tranſmiſſion of light reflected from a white ground. Our author, however, proceeds farther; and aſſerts, that even the colours of metals themſelves are produced in the ſame manner.

"Gold (ſays he) exhibits a white light, which is tinged with yellow. I have uſed this expreſſion, becauſe it appears from experiment that gold reflects a white light, and that its yellow colour is a tinge ſuperadded to its whiteneſs. The experiment is thus ſet forth by Sir Iſaac Newton. Gold in this light (that is, a beam of white light) appears of the ſame yellow colour as in day light, but by intercepting at the lens a due quantity of the yellow-making rays, it will appear white like ſilver, as I have tried; which ſhows, that its yellowneſs ariſes from the exceſs of the intercepted rays, tinging that whiteneſs with their colour when they are let paſs.

"I have already ſhown, by numerous experiments, in what manner coloured tinges are produced; and it uniformly appears, from all theſe experiments, that colours do not ariſe from reflection, but from tranſmiſſion only. A ſolution of ſilver is pellucid and colourleſs. A ſolution of gold tranſmits yellow, but reflects no colour. This metal alſo, when united with glaſs, yields no colour by reflection, but by tranſmiſſion only. All theſe circumſtances ſeem to indicate, that the yellow colour of gold ariſes from a yellow tranſparent matter, which is a conſtituent part of that metal; that it is equally mixed with the white particles of the gold, and tranſmits the light which is reflected by them, in like manner as when ſilver is gilt, or foils are made by covering white metals with tranſparent colours. But theſe factitious coverings are only ſuperficial; whereas the yellow matter of gold is diffuſed throughout the whole ſubſtance of the metal, and appears to envelope and cover each of the white particles. In whatſoever manner the yellow matter of gold is united to its white ſubſtance, it exiſts in a rare ſtate; for it bears only the ſame proportion to the white particles of the gold as that of the yellow-making rays which were intercepted bear to all the other rays compriſed in the white light of the ſun.

"Sir Iſaac Newton has ſhown, that when ſpaces or interſtices of bodies are repleniſhed with media of different denſities, the bodies are opaque; that thoſe ſuperficies of tranſparent bodies reflect the greateſt quantity of light which intercede media that differ moſt in their refractive denſities; and that the reflections of very thin tranſparent ſubſtances are conſiderably ſtronger than thoſe made by the ſame ſubſtances of a greater thickneſs. Hence the minute portions of air, or of the rarer medium which occupies ſpaces void of other matter, reflect a vivid white light whenever their ſurfaces are contiguous to media whoſe denſities differ conſiderably from their own; ſo that every ſmall maſs of air, or of the rarer medium, which fills the pores or interſtices of denſe bodies, is a minute white ſubſtance. This is manifeſt in the whiteneſs of froth, and of all pellucid colourleſs bodies; ſuch as glaſs, cryſtal, or ſalts, reduced to powder, or otherwiſe flawed: for in all theſe inſtances a white light is reflected from the air or rarer medium which intercede the particles of the denſer ſubſtances whoſe interſtices they occupy."

From theſe principles our author takes occaſion to explain the reaſon why the particles of metals, which yield no colour by incident light when ſuſpended in their ſolvents, are diſpoſed to exhibit colours when ſeparated from them. Hence alſo we ſee why opaque white ſubſtances are rendered pellucid by being reduced to uniform maſſes, whoſe component parts are every where nearly of the ſame denſity; for as all pellucid ſubſtances are rendered opaque and white by the admixture of pellucid colourleſs media of conſiderably different denſities, they are again deprived of their opacity by extricating theſe media which kept their particles at a diſtance from each other: thus froth or ſnow, when reſolved into water, loſe their whiteneſs, and aſſume their former pellucid appearance. In like manner, by proper fluxes, the opaque white earths are reduced to pellucid colourleſs glaſſes; becauſe all reflections are made at the ſurfaces of bodies differing in denſity from the ambient medium, and in the confines of equally denſe media there is no reflection.

As the oxides of metals are enabled to reflect their colours by the intervention of the particles of air; ſo, when mixed with oil in the making of paints, they always aſſume a darker colour, becauſe the exceſs of the denſity of oil over that of air forms a ſenſible difference when comparatively conſidered with reſpect to the ſpecific gravity of the rarer metals. From this cauſe perceptibly leſs light is reflected from the moleculæ of oil than from thoſe of air, and conſequently the maſs appears darker. The caſe, however, is different with ſuch paints as are formed of the denſer metals; as vermilion, minium, &c. for though oil differs very conſiderably from air in its ſpecific denſity, yet it alſo differs very much in this reſpect from the denſer metallic powders: and the moleculæ of oil which divide their particles act upon the light ſo ſtrongly, that the reflection occaſioned by them cannot be diſtinguiſhed from thoſe which are cauſed by rarer media. Hence though we mix vermilion or minium with oil, the colour is not ſenſibly altered.

41 Objections to his theory of metallic colours.

This part of our author's theory, however, ſeems liable to objection; for though it be true, that the oxides of ſome metals are denſer than others, yet that is, comparatively ſpeaking, but in a very ſmall proportion; nor is even the difference of denſity between oil and the oxides of the heavier metals at all comparable to that between the denſity of air and oil. Thus, though the oxide of iron may be 10 or 11 times more denſe than oil; yet, as the latter is between 500 or 600 times denſer than air, the ſmall difference between the oil and metallic oxide ought to be imperceptible. In this reſpect, indeed, there are conſiderable differences with regard to the oils employed, which cannot be ſuppoſed to ariſe from the mere circumſtance of denſity. Thus the colour of vermilion, when mixed with turpentine-varniſh, is much brighter than with linſeed-oil; and yet the difference between the denſities of linſeed-oil and turpentine-varniſh is very trifling. The mere action of heat likewiſe has a ſurpriſing effect in this caſe. Thus the red oxide of iron, called *ſcarlet-oker*, by being only heated a certain degree, appears of a very dark purple, reſuming its red colour when cold; and this variation may be induced as often as we pleaſe by only heating it over the fire in a ſhovel. In like manner, by gradually heating red lead, it may be made to aſſume a moſt beautiful crimſon colour; which growing gradually darker, becomes at laſt almoſt quite black. On cooling, if the heat has not been raiſed too high, it gradually returns through the ſame ſhades of colour, until at laſt it fixes in its original hue. Theſe immenſe differences in colour cannot by any means be attributed either to the expulſion of air, or to an alteration in denſity. The fire indeed does certainly expand theſe oxides as well as other bodies; but as the medium interſperſed between their particles is thus alſo expanded, the colour ought at leaſt to remain the ſame, if not to become lighter, on account of the ſuperior expanſion of air to that of metal by the ſame degree of heat. It would ſeem, therefore, that the action of the element of fire itſelf has a conſiderable ſhare in the production of colours; and indeed its ſhare in the operations of nature is ſo great, that we might well think it ſtrange if it ſhould be entirely excluded from this.

42 Of the colours of ſemipellucid ſubſtances.

With regard to ſemipellucid ſubſtances, which appear of one colour by incident, and another by tranſmitted light, our author likewiſe endeavours to ſhow that no reflection is made by the coloured matter, but only by the white or colourleſs particles. They conſiſt of pellucid media, throughout which white or colourleſs opaque particles are diſperſed. The latter are diſpoſed at ſuch diſtances from each other, that ſome of the incident rays of light are capable of paſſing through the intervals which intercede them, and thus are tranſmitted through the ſemipellucid maſs. Some ſorts of rays penetrate through ſuch maſſes, while others which differ from them in their refrangibility are reflected by the white or colourleſs particles; and from thence are tranſmitted through the pellucid part of the medium which intervenes between the reflecting particles and the anterior ſurface of the maſs. On the ſame principle our author explains the blue colour of the ſky, the green colour of the ſea, and other natural phenomena: and from his numerous experiments on this ſubject at laſt concludes, "that the power by which the ſeveral rays of light are tranſmitted through different media is inherent in the particles themſelves, and therefore is not confined to the ſurfaces of ſuch media. For if the tranſmiſſive force was exerted at the ſurface only, the thinner plates of coloured ſubſtances would act upon the rays as powerfully as thicker maſſes. But it appears from experiment, that in proportion as the rays paſs through different thickneſſes of coloured media, they exhibit colours differing not only in degree, but frequently in ſpecies alſo.

43
How colours are ſhown by tranſmitted light.

"The ſun's light, by which bodies are illuminated, conſiſts of all the rays of which a white light is compounded. Theſe rays, in their entire and undivided ſtate, are incident upon the opaque particles of ſemipellucid ſubſtances, and upon the colouring particles of tranſparent-coloured ſubſtances, whenever theſe media are expoſed to the light. When the rays accede to the opaque particles of ſemipellucid ſubſtances, ſome ſorts of them are reflected back from the anterior ſurface of thoſe particles: the other ſorts of rays, which are not reflected back, are diverted from the direction which is oppoſite to the anterior ſurface of the opaque particles, and paſſing through the intervals between the particles, are tranſmitted through the maſs.

"When the rays are incident upon the particles of tranſparent coloured bodies, none of them are reflected back; becauſe the colouring particles are not endowed with any reflective power; but ſome of the rays are either ſtopped at the anterior ſurface of the particles, or are diverted into ſuch directions as render them incapable of paſſing towards the further ſide of the maſs; and conſequently ſuch rays cannot be tranſmitted. The rays which are not thus intercepted or diſperſed, are tranſmitted in the ſame manner as thoſe which paſs through ſemipellucid media. Thus it is evident, that the coloured rays which are tranſmitted through ſemipellucid ſubſtances are *inflected* by the opaque particles; and thoſe which are tranſmitted through tranſparent-coloured ſubſtances are *inflected* by the colouring particles. From the preceding obſervations likewiſe it appears, that the particles of coloured media inflect the ſeveral ſorts of rays according to the ſeveral ſizes and denſities of the particles; alſo in proportion to the inflammability of the media which owe their colour to them; and it is manifeſt that the tranſmiſſion of coloured rays depends upon their inflection. All theſe obſervations are conformable to Sir Iſaac Newton's doctrine that the rays of light are reflected, refracted, and inflected, by one and the ſame principle acting variouſly in various circumſtances."

44
Of the manner in which light is reflected from white bodies.

The moſt remarkable part of Mr Delaval's doctrine is that concerning the metals; for the better underſtanding of which we ſhall premiſe a ſhort abſtract of his general doctrine concerning white bodies, and the manner in which light is reflected by them. "All the earths (he obſerves), which in their natural ſtate are of a pure white, conſtitute tranſparent colourleſs media when vitrified with proper fluxes, or when diſſolved in colourleſs menſtrua; and the ſaline maſſes obtainable from their ſolutions are tranſparent and colourleſs, while they retain the water which is eſſential to their cryſtallization, and are not flawed or reduced to powder; but after their pores and interſtices are opened in ſuch a manner as to admit the air, they become then white and opaque by the entrance of that rare medium. The earthy particles which form the ſolid parts of bodies generally exceed the other in denſity; conſequently theſe particles, when contiguous to the rare media already mentioned, muſt reflect the rays of light with a force proportionate to their denſity. The reflective power of bodies does not depend merely upon their exceſs of denſity, but upon their difference of denſity with reſpect to the ſurrounding media. Tranſparent colourleſs particles, whoſe denſity is greatly inferior to that of the media they come between, alſo powerfully reflect all ſorts of rays, and thereby become white. Of this kind are the air or other rare fluids which occupy the interſtices of liquors; and in general of all denſer media into whoſe interſtices ſuch rare particles are admitted.

Hence we may conclude, that white opaque bodies are conſtituted by the union or contiguity of two or more tranſparent colourleſs media differing conſiderably from each other in their reflective powers. Of theſe ſubſtances we have examples in froth, emulſions, or other imperfect combinations of pellucid liquors, milk, ſnow, calcined or pulverized ſalts, glaſs or cryſtal reduced to powder, white earths, paper, linen, and even thoſe metals which are called white by mineralogiſts and chemiſts: for the metals juſt mentioned do not appear white unleſs their ſurfaces be rough; as in that caſe only there are interſtices on their ſurfaces ſufficient to admit the air, and thus make a reflection of a white and vivid light.

"But the poliſhed ſurfaces of metallic mirrors reflect the incident rays equably and regularly, according to their ſeveral angles of incidence; ſo that the reflected rays do not interfere with each other, but remain ſeparate and unmixed, and therefore diſtinctly exhibit their ſeveral colours. Hence it is evident, that white ſurfaces cannot act upon the light as mirrors; becauſe all the rays which are reflected from them are blended in a promiſcuous and diſorderly manner.

45
Of the cauſe of opacity.

"The above mentioned phenomena give much inſight into the nature and cauſe of opacity: as they clearly ſhow, that even the rareſt tranſparent colourleſs ſubſtances, when their ſurfaces are adjacent to media differing greatly from them in refractive power, may thereby acquire a perfect opacity, and may aſſume a reſplendency and hue ſo ſimilar to that of white metals, that the rarer pellucid ſubſtances cannot by the ſight be diſtinguiſhed from the denſe opaque metals. And this ſimilarity to the ſurfaces of metals, occurs in the rare pellucid ſubſtances, not only when, from the roughneſs of their ſurfaces, they reſemble unpoliſhed metals in whiteneſs, but alſo when, from their ſmoothneſs, they reſemble the poliſhed ſurfaces of metals.

“ Metals ſeem to conſiſt entirely of tranſparent matter, and to derive their apparent opacity and luſtre ſolely from the copious reflection of light from their ſurfaces. The analogy between the metals and tranſparent media, as far as reſpects their optical properties, will appear from the following conſiderations.

“ 1. All metals diſſolved in their proper menſtrua are tranſparent. 2. By the union of two or more tranſparent media, ſubſtances are conſtituted which are ſimilar to metals in their opacity and luſtre, as plumbago and marcaſites. 3. The tranſparent ſubſtances of metals, as well as thoſe of minerals, by their union with carbone, acquire their ſtrong reflective powers from which their luſtre and opacity ariſe. 4. The ſurfaces of pellucid media, ſuch as glaſs or water, aſſume a metallic appearance, when by their ſmoothneſs, difference of denſity with reſpect to the contiguous media, or any other cauſe, they are diſpoſed copiouſly to reflect the light.

“ From all theſe conſiderations it is evident, that opaque ſubſtances are conſtituted by the union or contiguity of tranſparent colourleſs media, differing from one another in their reflective powers; and that, when the common ſurface, which comes between ſuch media, is plane, equal, and ſmooth, it reflects the incident rays equally and regularly as a mirror; but when the ſurface is rough and unequal, or divided into minute particles, it reflects the incident rays irregularly and promiſcuouſly in different directions, and conſequently appears white.”

46 Theory of colours ſtill uncertain.

From all theſe experiments we can only conclude, that the theory of colours ſeems not yet to be determined with certainty; and very formidable, perhaps unanſwerable, objections might be brought againſt every hypotheſis on this ſubject that hath been invented. The diſcoveries of Sir Iſaac Newton, however, are ſufficient to juſtify the following

APHORISMS.

1. All the colours in nature proceed from the rays of light.

2. There are ſeven primary colours; which are red, orange, yellow, green, blue, indigo, and violet.

3. Every ray of light may be ſeparated into the ſeven primary colours.

4. The rays of light in paſſing through the ſame medium have different degrees of refrangibility.

5. The difference in the colours of light ariſes from its different refrangibility: that which is the leaſt refrangible producing red; and that which is the moſt frangible, violet.

6. By compounding any two of the primary colours, as red and yellow, or yellow and blue, the intermediate colour, as orange or green, may be produced.

7. The colours of bodies ariſe from their diſpoſitions to reflect one ſort of rays, and to abſorb the other; thoſe that reflect the leaſt refrangible rays appearing red; and thoſe that reflect the moſt refrangible, violet.

8. Such bodies as reflect two or more ſorts of rays appear of various colours.

9. The whiteneſs of bodies ariſes from their diſpoſition to reflect all the rays of light promiſcuouſly.

10. The blackneſs of bodies proceeds from their incapacity to reflect any of the rays of light (c).

Entertaining EXPERIMENTS, *founded on the preceding Principles.*

I. *Out of a ſingle colourleſs ray of light to produce ſeven other rays, which ſhall paint, on a white body, the ſeven primary colours of nature.*

Plate CXLV. Fig. 1.

PROCURE from an optician a large glaſs priſm DEF, well poliſhed, two of whoſe ſides muſt contain an angle of about ſixty-four degrees. Make a room quite dark, and in the window-ſhutter AB, cut a round hole, about one-third of an inch in diameter, at C, through which a ray of light LI paſſing, falls on the priſm DEF; by that it is refracted out of the direction IT, in which it would have proceeded into another GH; and, falling on the paper MNSX, will there form an oblong ſpectrum PQ, whoſe ends will be ſemicircular, and its ſides ſtraight; and if the diſtance of the priſm from the paper be about eighteen feet, it will be ten inches long, and two inches wide. This ſpectrum will exhibit all the primary colours; the rays between P and V, which are the moſt refracted, will paint a deep violet; thoſe between V and I, indigo; thoſe between I and B, blue; thoſe between B and G, green; thoſe between G and Y, yellow; thoſe between Y and O, orange; and thoſe between O and R, being the leaſt refracted, an intenſe red. The colours between theſe ſpaces will not be everywhere equally intenſe, but will incline to the neighbouring colour: thus the part of the orange next to R will incline to a red, that next to Y to a yellow; and ſo of the reſt.

II. *From two or more of the primary colours, to compoſe others that ſhall, in appearance, reſemble thoſe of the former.*

By mixing the two homogeneous colours red and yellow, an orange will be produced, ſimilar in appearance to that in the ſeries of primary colours; but the light of the one being homogeneous, and that of the other heterogeneous, if the former be viewed through a priſm it will remain unaltered, but the other will be reſolved into its component colours red and yellow. In like manner, other contiguous homogeneous colours may compound new colours; as by mixing yellow and green, a colour between them is formed; and if blue be added, there will appear a green, that is the middle colour

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(c) From hence it ariſes, that black bodies, when expoſed to the ſun, become ſooner heated than all others.

colour of thoſe three. For the yellow and blue, if they are equal in quantity, will draw the intermediate green equally toward them, and keep it, as it were, in equilibrio, that it verge not more to the one than to the other. To this compound green there may be added ſome red and violet ; and yet the green will not immediately ceaſe, but grow leſs vivid ; till by adding more red and violet it will become more diluted ; and at laſt, by the prevalence of the added colours, it will be overcome, and turned into ſome anomalous colour.

If the ſun's white, compoſed of all kinds of rays, be added to any homogeneous colour, that colour will not vaniſh, nor change its ſpecies, but be diluted ; and by adding more white, it will become continually more diluted. Laſtly, if red and violet be mixed, there will be generated, according to their various proportions, various purples, ſuch as are not like, in appearance, to the colour of any homogeneous light ; and of theſe purples, mixed with blue and yellow, other new colours may be compoſed.

III. *Out of three of the primary colours, red, yellow, and blue, to produce all the other priſmatic colours, and all that are intermediate to them.*

Fig. 2. Provide three panes of glaſs of about five inches ſquare ; and divide each of them, by parallel lines, into five equal parts. Take three ſheets of very thin paper ; which you muſt paint, lightly, one blue, another yellow, and the third red (D). Then paſte on one of the glaſſes five pieces of the red paper, one of which muſt cover the whole glaſs, the ſecond only the four lower diviſions, the third the three lower, the fourth the two loweſt, and the fifth the laſt diviſion only. On the other glaſſes five pieces of the blue and yellow papers muſt be paſted in like manner. You muſt alſo have a box of about ſix inches long, and the ſame depth and width as the glaſſes ; it muſt be black on the inſide : let one end be quite open, and in the oppoſite end there muſt be a hole large enough to ſee the glaſſes completely. It muſt alſo open at the top, that the glaſſes may be placed in it conveniently.

When you have put any one of theſe glaſſes in the box, and the open end is turned toward the ſun, you will ſee five diſtinct ſhades of the colour it contains. If you place the blue and yellow glaſſes together, in a ſimilar direction, you will ſee five ſhades of green diſtinctly formed. When the blue and red glaſſes are placed, a bright violet will be produced : and by the red and yellow, the ſeveral ſhades of orange.

Fig. 3. If, inſtead of placing theſe glaſſes in a ſimilar poſition, you place the ſide AB of the yellow glaſs againſt the ſide BD of the blue, you will ſee all the various greens that are produced by nature (E) ; if the blue and red glaſſes be placed in that manner, you will have all the poſſible varieties of purples, violets, &c. ; and, laſtly, if the red and orange glaſſes be ſo placed, there will be all the intermediate colours, as the marygold, aurora, &c.

IV. *By means of the three primary colours, red, yellow, and blue, together with light and ſhade, to produce all the gradations of the priſmatic colours.*

On ſeven ſquare panes of glaſs, paſte papers that are painted with the ſeven priſmatic colours, in the ſame manner as the laſt experiment. The colours for the orange, green, indigo, and violet, may be made by mixing the other three. Then with biſtre (F), well diluted, ſhade a ſheet of very thin paper, by laying it light on both its ſides. With pieces of this paper cover four-fifths of a glaſs, of the ſame ſize with the others by laying one piece on the four loweſt diviſions, another on the three loweſt, a third on the two loweſt, and the fourth on the loweſt diviſion only, and leaving the top diviſion quite uncovered. When one of the coloured glaſſes is placed in the box, together with the glaſs of ſhades, ſo that the ſide AB of the one be applied to the ſide BC of the other, as in fig. 3. the ſeveral gradations of colours will appear ſhaded in the ſame manner as a drapery judiciouſly painted with that colour.

It is on this principle that certain French artiſts have proceeded in their endeavours to imitate, by deſigns printed in colours, paintings in oil : which they do by four plates of the ſame ſize, on each of which is engraved the ſame deſign. One of theſe contains all the ſhades that are to be repreſented, and which are painted either black or with a dark gray. One of the three other plates is coloured with blue, another with red, and the third with yellow ; each of them being engraved on thoſe parts only which are to repreſent that colour (G) ; and the engraving is either ſtronger or weaker, in proportion to the tone of colour that is to be repreſented (H).

Theſe four plates are then paſſed alternately under the

(D) Water-colours muſt be uſed for this purpoſe : the blue may be that of Pruſſia, and very bright ; the red, carmine ; and the yellow, gamboge, mixed with a little ſaffron. Theſe colours muſt be laid very light and even on both ſides of the paper.

(E) In the firſt poſition of the glaſſes, the quantity of blue and yellow being equal, the ſame ſort of green was conſtantly viſible : but by thus inverting the glaſſes, the quantity of the colours being conſtantly unequal, a very pleaſing variety of tints is produced.

(F) The biſtre here uſed muſt be made of ſoot, not that in ſtone.

(G) When a red drapery is required, it is engraved on the plate aſſigned to that colour ; and ſo of yellow and blue : but if one of the other colours be wanting, ſuppoſe violet, it muſt be engraved on thoſe that print the red blue : and ſo of the reſt. The plates of this kind have been hitherto engraved in the manner of mezzotinto ; but theſe, unleſs they are ſkilfully magnaged, are ſoon effaced. Engravings in the manner of crayon will perhaps anſwer better.

(H) The principal difficulty in this ſort of engraving ariſes from a want of a ſkilful management, in giving each plate that preciſe degree of engraving which will produce the tone of colour required. If a bright green is the preſs, and the mixture of their colours produces a print that bears no ſmall reſemblance to a painting. It muſt be confeſſed, however, that what has been hitherto done of this kind falls far ſhort of that degree of perfection of which this art appears ſuſceptible. If they who engrave the beſt in the manner of the crayon, were to apply themſelves to this art, there is reaſon to expect they would produce far more finiſhed pieces than we have hitherto ſeen.

V. *To make figures appear of different colours ſucceſſively.*

g. 4 Make a hole in the window-ſhutter of a dark room, through which a broad beam of light may paſs, that is to be refracted by the large glaſs priſm ABC, which may be made of pieces of mirrors cemented together, and filled with water. Provide another priſm DEF, made of three pieces of wood, through the middle of this there muſt paſs an axis on which it is to revolve. This priſm muſt be covered with white paper; and each of its ſides cut through in ſeveral places, ſo as to repreſent different figures; and thoſe of each ſide ſhould likewiſe be different. The inſide of this priſm is to be hollow, and made quite black, that it may not reflect any of the light that paſſes through the ſides into it. When this priſm is placed near to that of glaſs, as in the figure, with one of its ſides EF perpendicular to the ray of light, the figures on that ſide will appear perfectly white: but when it comes into the poſition *g h*, the figures will appear yellow and red; and when it is in the poſition *k l*, they will appear blue and violet. As the priſm is turned round its axis, the other ſides will have a ſimilar appearance. If, inſtead of a priſm, a four or five-ſided figure be here uſed, the appearances will be ſtill further diverſified.

This phenomenon ariſes from the different refrangibility of the rays of light. For when the ſide EF is in the poſition *g h*, it is more ſtrongly illuminated by the leaſt refrangible rays; and wherever they are predominant, the object will appear red or yellow. But when it is on the poſition *k l*, the more refrangible rays being then predominant, it will appear tinged with blue and violet.

VI. *The ſolar magic lantern.*

Procure a box, of about a foot high, and eighteen inches wide, or ſuch other ſimilar dimenſions as you ſhall think fit, and about three inches deep. Two of the oppoſite ſides of this box muſt be quite open; and in each of the other ſides let there be a groove, wide enough to paſs a ſtiff paper or paſteboard. This box muſt be faſtened againſt a window on which the ſun's rays fall direct. The reſt of the window ſhould be cloſed up, that no light may enter. Provide ſeveral ſheets of ſtiff paper, which muſt be blacked on one ſide. On theſe papers cut out ſuch figures as you ſhall think proper; and placing them alternately in the grooves of the box, with their blacked ſides towards you, look at them through a large and clear glaſs priſm: and if the light be ſtrong, they will appear to be painted with the moſt lively colours in nature. If you cut on one of theſe papers the form of the rainbow, about three quarters of an inch wide, you will have a lively repreſentation of that in the atmoſphere.

This experiment may be farther diverſified, by paſting very thin papers, lightly painted with different colours, over ſome of the parts that are cut out: which will appear to change their colours when viewed through the priſm, and to ſtand out from the paper, at different diſtances, according to the different degrees of refrangibility of the colours with which they are painted. For greater convenience, the priſm may be placed in a ſtand on a table, at the height of your eye, and made to turn round on an axis, that when you have got an agreeable proſpect, you may fix it in that poſition.

VII. *The priſmatic camera obſcura.*

Fig. 5. Make two holes F, *f*, in the ſhutter of a dark chamber, near to each other; and againſt each hole place a priſm ABC, and *a b c*, in a perpendicular direction, that their ſpectrums NM may be caſt on the paper in a horizontal line, and coincide with each other; the red and violet of the one being in the ſame part with thoſe of the other. The paper ſhould be placed at ſuch a diſtance from the priſms that the ſpectrum may be ſufficiently dilated. Provide ſeveral papers nearly of the ſame dimenſions with the ſpectrum; croſs theſe papers, and draw lines parallel to the diviſions of the colours. In theſe diviſions cut out ſuch figures as you ſhall find will have an agreeable effect, as flowers, trees, animals, &c. When you have placed one of theſe papers in its proper poſition, hang a black cloth or paper behind it, that none of the rays that paſs through may be reflected and confuſe the phenomena. The figures cut on the paper will then appear ſtrongly illuminated with all the original colours of nature. If, while one of the priſms remains at reſt, the other be revolved on its axis, the continual alteration of the colours will afford a pleaſing variety; which may be further increaſed by turning the priſm round in different directions.

When the priſms are ſo placed that the two ſpectrums become coincident in an inverted order of their colours, the red end of one falling on the violet end of the other; if they be then viewed through a third priſm DH, held parallel to their length, they will no longer appear coincident, but in the form of two diſtinct ſpectrums, *p t* and *n m* (fig. 6.), croſſing one another in the middle, like the letter X: the red of one ſpectrum and the violet of the other, which were coincident at NM, being parted from each other by a greater refraction of the violet to *p* and *m*, than that of the red to *n* and *t*.

This experiment may be further diverſified by adding two other priſms, that ſhall form a ſpectrum in the ſame line, and contiguous to the other; by which not only the variety of figures, but the viciſſitude of colours, will be conſiderably augmented.

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is to be repreſented, there ſhould be an equal quantity of engraving on the red and yellow plates: but if an olive green, the yellow plate ſhould be engraved much deeper than the red.

VIII. *The diatonic ſcale of colours.*

The illuſtrious Newton, in the courſe of his inveſtigations of the properties of light, diſcovered that the length of the ſpaces which the ſeven primary colours poſſeſs in the ſpectrum, exactly correſponds to thoſe of chords that ſound the ſeven notes in the diatonic ſcale of muſic: As is evident by the following experiment.

Fig. 7. On a paper in a dark chamber, let a ray of light be largely refracted into the ſpectrum AFTMGP, and mark the preciſe boundaries of the ſeveral colours, as *a*, *b*, *c*, &c. Draw lines from thoſe points perpendicular to the oppoſite ſide, and you will find that the ſpaces M *r f* F, by which the red is bounded; *r g e f*, by which the orange is bounded; *q p e d*, by which the yellow is bounded, &c. will be in exact proportion to the diviſions of a muſical chord for the notes of an octave; that is, as the intervals of theſe numbers 1, $\frac{8}{9}$, $\frac{5}{6}$, $\frac{3}{4}$, $\frac{2}{3}$, $\frac{1}{3}$, $\frac{9}{10}$, $\frac{1}{2}$.

IX. *Colorific muſic.*

Father Caſtel, a Frenchman, in a curious book he has publiſhed on chromatics, ſuppoſes the note *ut* to anſwer to blue in the priſmatic colours; the note *re* to yellow, and *mi* to red. The other tones he refers to the intermediate colours; from whence he conſtructs the following gamut of colorific muſic:

Ut	Blue
Ut ſharp	Sea green
Re	Bright green
Re ſharp	Olive green
Mi	Yellow
Fa	Aurora
Fa ſharp	Orange
Sol	Red
Sol ſharp	Crimſon
La	Violet
La ſharp	Blue violet
Si	Sky blue
Ut	Blue

This gamut, according to this plan, is to be continued in the ſame manner for the following octave; except that the colours are to be more vivid.

He ſuppoſes that theſe colours, by ſtriking the eye in the ſame ſucceſſion as the ſounds (to which he makes them analogous) do the ear, and in the ſame order of time, they will produce correſpondent ſenſations of pleaſure in the mind. It is on theſe general principles, which F. Caſtel has elucidated in his treatiſe, that he has endeavoured, though with little ſucceſs, to eſtabliſh his ocular harpſichord.

The conſtruction of this inſtrument, as here explained, will ſhow that the effects produced by colours by no means anſwer thoſe of ſounds, and that the principal relation there is between them conſiſts in the duration of the time that they reſpectively affect the ſenſes.

Between two circles of paſteboard, of ten inches diameter, AB and CD, incloſe a hollow paſteboard cylinder E, 18 inches long. Divide this cylinder into ſpaces half an inch wide, by a ſpiral line that runs round it from the top to the bottom, and divide its ſurface into ſix equal parts by parallel lines drawn between its two extremities: as is expreſſed in the figure.

Let the circle AB, at top, be open, and let that at bottom, CD, be cloſed, and ſupported by an axis or ſcrew, of half an inch diameter, which muſt turn freely in a nut placed at the bottom of a box we ſhall preſently deſcribe. To the axis juſt mentioned adjuſt a wooden wheel G, of two inches and a half in diameter, and that has 12 or 15 teeth, which take the endleſs ſcrew H. Let this cylinder be incloſed in a box ILMN (fig. 9.) whoſe baſe is ſquare, and at whoſe bottom there is a nut, in which the axis F turns. Obſerve that the endleſs ſcrew H ſhould come out of the box, that it may receive the handle O, by which the cylinder is to be turned.

This box being cloſed all round, place over it a tin covering A, which will be perforated in different parts; from this cover there muſt hang three or four lights, ſo placed that they may ſtrongly illumine the inſide of the cylinder. In one ſide of this box (which ſhould be covered with paſteboard) cut eight apertures, *a*, *b*, *c*, *d*, *e*, *f*, *g*, *h*, of half an inch wide, and $\frac{1}{4}$ of an inch high; they muſt be directly over each other, and the diſtance between them muſt be exactly two inches. It is by theſe openings, which here correſpond to the muſical notes, that the various colours analogous to them are to appear; and which being placed on the paſteboard cylinder, as we have ſhown, are reflected by means of the lights placed within it. Fig. 9.

It is eaſy to conceive, that when the handle O is turned, the cylinder in conſequence riſing half an inch, if it be turned five times round, it will ſucceſſively ſhow, at the openings made in the ſide of the box, all thoſe that are in the cylinder itſelf, and which are ranged according to the direction of the inclined lines drawn on it. It is therefore according to the duration of the notes which are to be expreſſed, that the apertures on the cylinder are to be cut. Obſerve, that the ſpace between two of the parallel lines drawn vertically on the cylinder, is equal to one meaſure of time; therefore, for every turn of the cylinder, there are ſix meaſures, and thirty meaſures for the air that is to be played by this inſtrument.

The ſeveral apertures being made in the ſide of the cylinder, in conformity to the notes of the tune that is to be expreſſed, they are to be covered with double pieces of very thin paper, painted on both ſides with the colurs that are to repreſent the muſical notes.

This experiment might be executed in a different manner, and with much greater extent; but as the entertainment would not equal the trouble and expence, we have thought it ſufficient to give the above piece, by which the reader will be enabled to judge how far the analogy ſuppoſed by F. Caſtel really exiſts.

CHRONIC,

CHROMATICS.

Plate CXLV.

Fig. 3.

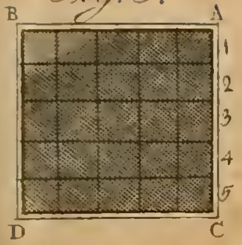


Fig. 2.

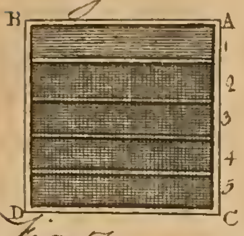


Fig. 1.

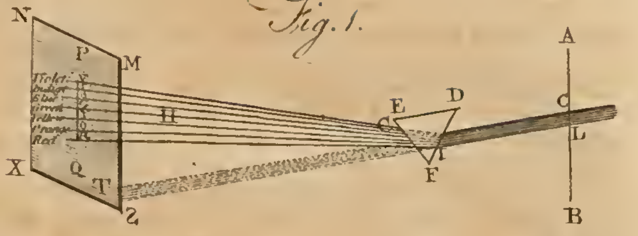


Fig. 7.

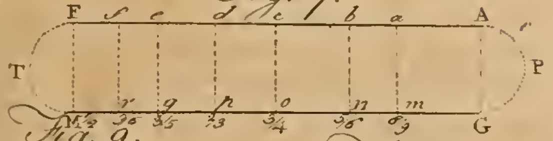


Fig. 4.

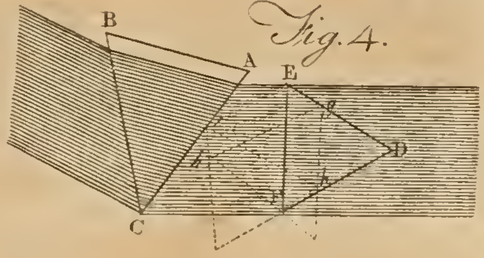


Fig. 9.

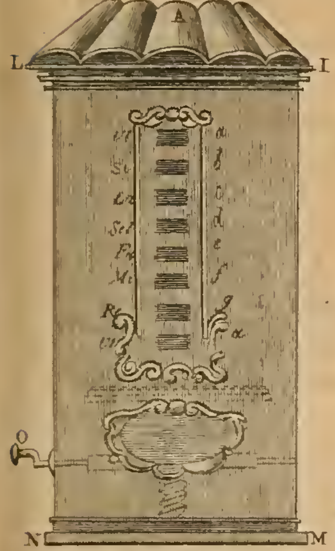


Fig. 8.

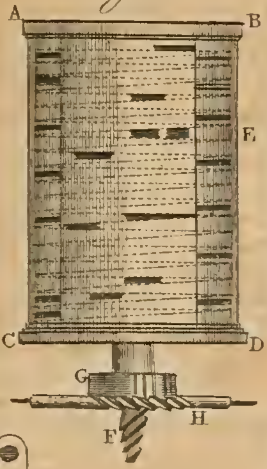


Fig. 6.

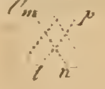
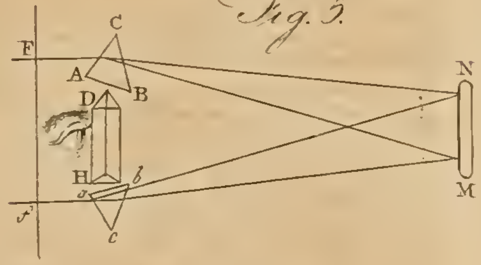
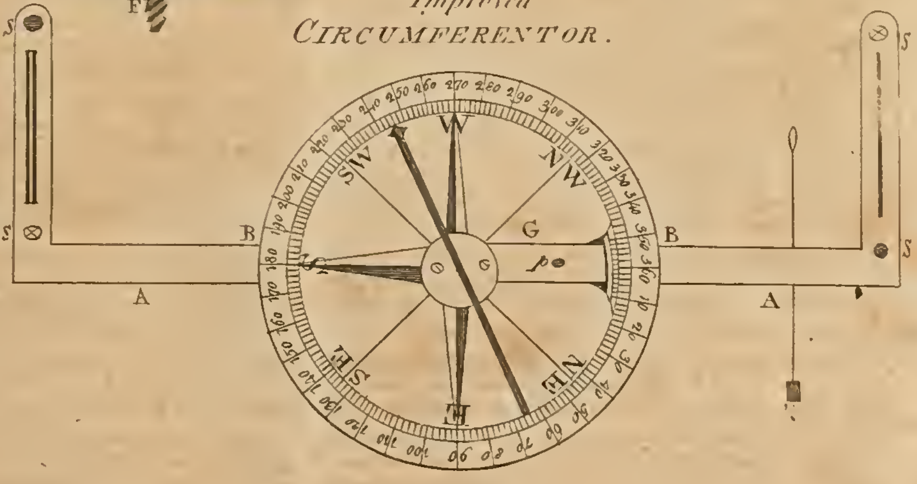


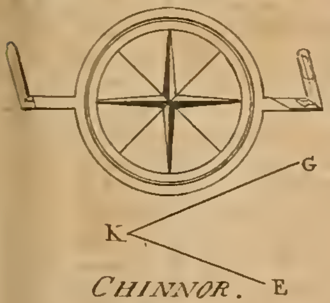
Fig. 5.



Improved CIRCUMFERENTOR.

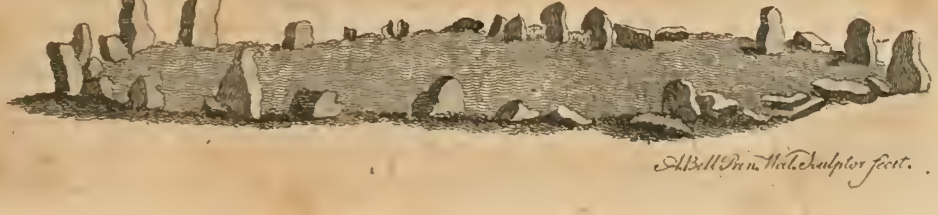


CIRCUMFERENTOR



CHINNOR.

Druidical CIRCLE.



A.Bell Prin. Wal. Sculptor fecit.

CHRONIC, or CHRONICAL, among phyſicians, an appellation given to diſeaſes that continue a long time; in contradiſtinction to thoſe that ſoon terminate, and are called *acute*.

CHRONICLE, in matters of literature, a ſpecies or kind of hiſtory diſpoſed according to the order of time, and agreeing in moſt reſpects with annals. See ANNALS.

Parian CHRONICLE. See *ARUNDELIAN Marbles*. Since that article was printed, in which an abſtract was given of Mr Robertſon's doubts and obſervations reſpecting the authenticity of the Parian Chronicle, one or two publications have ſince appeared in anſwer, but none of them calculated to remove the objections, or materially to affect the arguments that had been ſtated with ſo much learning and ingenuity againſt it. The following ſtrictures, however, with which the Monthly Reviewers have concluded their critique of Mr Robertſon's performance, ſeem to merit conſideration.

Monthly Review. Jan. 1789.

On Objection I. *That the characters have no certain or unequivocal marks of antiquity*, the Reviewers remark, that this ſeems rather to be an anſwer to a defender of the inſcription, than an objection. If a zealous partizan of the marble ſhould appeal to its characters and orthography, as deciſive proofs of its being genuine, it would be proper enough to anſwer, that theſe circumſtances afford no certain criterion of authenticity. But in this word *certain* ſculks an unlucky ambiguity. If it means demonſtrative, it muſt be allowed that no inſcription can be proved to be certainly genuine from theſe appearances; but if it means no more than highly probable, many inſcriptions poſſeſs ſufficient internal evidence to give their claims this degree of certainty. The true queſtion is, Has not the Parian Chronicle every mark of antiquity that can be expected in a monument claiming the age of 2000 years? The letters Γ and Ξ are, by Mr R's own confeſſion, ſuch as occur in genuine inſcriptions: and to ſay in anſwer, that an impoſtor might copy the forms of theſe letters from other inſcriptions, is already to ſuppoſe the inſcription forged, before it is rendered probable by argument. The learned author of the Diſſertation ſeems to betray ſome doubt of his own concluſion: for he adds, p. 56. "that the antiquity of an inſcription can never be proved by the mere form of the letters, becauſe the moſt ancient characters are as eaſily counterfeited as the modern." But this objection is equally applicable to all other ancient inſcriptions; and is not to the purpoſe, if the preſent inſcription has any peculiar marks of impoſture in its characters and orthography. "The characters do not reſemble the Sigean, the Nemean, or the Delian inſcriptions." Mr R. anſwers this objection himſelf, by adding, "which are ſuppoſed to be of a more ancient date." The oppoſite reaſon to this will be a ſufficient anſwer to the other objection, "that they do not reſemble the Farneſian pillars or the Alexandrian MS." If "they differ in many reſpects from the Marmor Sandvicenſe," they may be preſumed to agree in many. "They ſeem to reſemble, more than any other, the alphabet taken by Montfauçon from the marmor Cyzicenum." Thus it appears that the Parian Chronicle moſt nearly reſembles the two inſcriptions, to whoſe age it moſt nearly approaches.

When Mr R. adds, that the letters "are ſuch as an ordinary ſtone-cutter would probably make, if he were employed to engrave a Greek inſcription, according to the alphabet now in uſe," he muſt be underſtood *cum grano ſalis*. The engraver of a fac-ſimile generally omits ſome nice and minute touches in taking his copy; but, even with this abatement, we dare appeal to any adept in Greek calligraphy, whether the ſpecimen facing p. 56. will juſtify our author's obſervation? "The ſmall letters (ο, Θ, Ω,) intermixed among the larger, have an air of affectation and artifice." Then has the greater part of ancient inſcriptions an air of affectation and artifice. For the ο is perpetually engraved in this diminutive ſize; and Ω being of a kindred ſound, and Θ of a kindred ſhape, how can we wonder that all three ſhould be repreſented of the ſame magnitude? In the inſcription which immediately follows the marble in Dr Chandler's edition, N° xxiv. theſe very three letters are never ſo large as the reſt, and often much ſmaller; of which there are inſtances in the three firſt lines. See alſo two medals in the ſecond part of Dorville's Sicula, Tab. xvi. Numb. 7 9.

"From the archaiſms, ſuch as εγ Λυκωρειας, εγ Κυβελοις, εμ Παρωι, &c. &c. no concluſion can be drawn in favour of the authenticity of the inſcription." Yet ſurely every thing common to it with other inſcriptions, confeſſedly genuine, creates a reaſonable preſumption in its favour. "But what reaſon could there be for theſe archaiſms in the Parian Chronicle? We do not uſually find them in Greek writers of the ſame age, or even of a more early date." The reaſon is, according to our opinion, that ſuch archaiſms were then in uſe: this we know from other inſcriptions, in which ſuch archaiſms (or, as our author afterwards calls them, barbariſms) are frequent. Nothing can be inferred from the Greek writers, unleſs we had their autographs. The preſent ſyſtem of orthography in our printed Greek books is out of the queſtion. Again, "The inſcription ſometimes adopts and ſometimes neglects theſe archaiſms, as in lines 4, 12, 27, 52, 63, 67." This inconſiſtency either is no valid objection, or if it be valid, will demoliſh not only almoſt every other inſcription, but almoſt every writing whatſoever. For example, in the inſcription juſt quoted, N° xxiv. we find τοΝ βασιλεα, l. 20. and οταΜ, τιμτηι, 24. A little farther, N° xxvi. l. 31. we have εΓ Μαγνησιας, 57. 73. 81. εΚ Μαγνησιας, and 106. 108. εΚΓ Μαγνησιας. The Corcyrean inſcription (Montfauçon, Diar. Ital. p. 420.) promiſcuouſly uſes εΚδανειζομαι and εΓδανειζομαι. In Engliſh, who is ſurpriſed to find *has* and *hath*, *a hand* and *an hand*, *a uſeful* and *an uſeful*, in the works of the ſame author? We could produce inſtances of this inaccuracy from the ſame page, nay from the ſame ſentence.

"The authenticity of thoſe inſcriptions, in which theſe archaiſms appear, muſt be eſtabliſhed, before they can be produced in oppoſition to the preſent argument." This is, we cannot help thinking, rather too ſevere a reſtriction. If no inſcription may be quoted before it be proved genuine, the learned author of the Diſſertation need not be afraid of being confuted; for nobody will engage with him on ſuch conditions. Perhaps the reverſe of the rule will be thought more equitable; that every inſcription be allowed to be genuine, till its authenticity be rendered doubtful by probable arguments. We will conclude this head with two ſhort obſervations. In Selden's copy, l. 26. was written ΠΟΗΣΙΝ, which the latter editions have altered to ΠΟΙΗΣΙΝ, but without reaſon, the other being the more ancient way of writing, common in MSS. and ſometimes found on inſcriptions. (See G. Koen's Notes on *Gregorius de Dialectis*, p. 30.) In l. 83. the marble has Καλλιου, for which Palmer wiſhed to ſubſtitute Καλλιου. Dr Taylor refutes him from the *Marmor Sandvicenſe*, obſerving at the ſame time, that this orthography occurs in no other place whatever except in theſe two monuments. Is it likely that two engravers ſhould by chance coincide in the ſame miſtake, or that the forger of the Parian Chronicle (if it be forged) ſhould have ſeen the *Marmor Sandvicenſe*, and taken notice of this peculiarity with the intention of afterward employing it in the fabrication of an impoſture?

The reviewers next proceed to conſider, but more briefly, the other objections.

II. *It is not probable that the Chronicle was engraved for private uſe.*—1. *Becauſe it was ſuch an expence, as few learned Greeks were able to afford.* If only a *few* were able to afford it, ſome one of thoſe few might be willing to incur it. But let Mr R. conſider how likely it is that a modern, and probably a needy Greek, ſhould be more able to afford it in the laſt century, than a learned Greek 2000 years ago! 2. *A manuſcript is more readily circulated.* Do men never prefer cumbrous ſplendor to cheapneſs and convenience? And if this compoſition, inſtead of being engraved on marble, had been committed to parchment, would it have had a better chance of coming down to the preſent age? Such a flying ſheet would ſoon be loſt; or, if a copy had, by miracle, been preſerved to us, the objections to its being genuine would be more plauſible than any that have been urged againſt the inſcription. What Mr R. ſays about the errors to which an inſcription is liable, &c. will only prove that chronological inſcriptions ought not to be engraved; but not that they never were. We allow that the *common* method of writing in the reign of Ptolemy Philadelphus was NOT on STONES. But it was common enough to occur to the mind of any perſon who wiſhed to leave behind him a memorial at once of his learning and magnificence.

III. This objection, *that the marble does not appear to be engraved by public authority*, we ſhall readily admit, though Bentley (Diſſ. on Phalaris, p. 251.) leans to the contrary opinion. In explaining this objection, the learned diſſertator obſerves, that though the expreſſion, αρχοντος εμ Παρωι, would lead us to ſuppoſe that the inſcription related to Paros, not a ſingle circumſtance in the hiſtory of that iſland is mentioned. But this expreſſion only ſhows that the author was an inhabitant of Paros, and intended to give his readers a clue, or *parapegma*, by the aid of which they might adjuſt the general chronology of Greece to the dates of their own hiſtory. "It is as abſurd as would be a marble in Jamaica containing the revolutions of England." We ſee no abſurdity in ſuppoſing a book to be written in Jamaica containing the revolutions of England. The natives of Paros were not unintereſted in events relating to the general hiſtory of Greece, particularly of Athens; and how can we tell whether the author were an *inquilinus*, or a native of the iſland; whether he thought it a place beneath his care; or whether he had devoted a ſeparate inſcription to the chronology of Paros?

IV. *It has been frequently obſerved, that the earlier periods of the Grecian hiſtory are involved in darkneſs and confuſion.* Granted. It follows then, that "an author who ſhould attempt to ſettle the dates of the earlier periods would frequently contradict preceding, and be contradicted by ſubſequent, writers; that he would naturally fall into miſtakes; and at beſt could only hope to adopt the moſt probable ſyſtem. But the difficulty of the taſk, or the impoſſibility of ſucceſs, are not ſufficient to prove that no man has been raſh or mad enough to make the attempt." On the contrary, we know that many have made it. What a number of diſcordant opinions has Mr R. himſelf given us from the ancients concerning the age of Homer? This conſideration will in part obviate another objection, that the Parian Chronicle does not agree with any ancient author. For if the ancients contradict one another, how could it follow more than one of them? and why might not the author, without any imputation of ignorance or raſhneſs, ſometimes depart from them all? If indeed he diſagrees with them when they are unanimous, it might furniſh matter for ſuſpicion; though even this would be far from a deciſive argument, unleſs the ancients were ſo extremely unlike the moderns, as never to be fond of ſingular and paradoxical poſitions.

V. *This Chronicle is not once mentioned by any writer of antiquity.* How many of thoſe inſcriptions, which are preſerved to the preſent day, are mentioned by claſſical authors? Verrius Flaccus compoſed a Roman kalendar, which, as a monument of his learning and induſtry, was engraved on marble, and fixed in the moſt public part of Preneſte. Fragments of this very kalendar were lately dug up at Preneſte, and have been publiſhed by a learned Italian. Now if the paſſage of Suetonius, which informs us of this circumſtance, had been loſt, would the ſilence of the Latin writers prove that the fragments were not genuine remains of antiquity? It may be ſaid that the caſes are not parallel; for not a ſingle author mentions the Parian Chronicle, whereas Suetonius does mention Verrius's Roman kalendar. To this we anſwer, It is dangerous to deny the authenticity of any monument on the ſlender probability of its being caſually mentioned by a ſingle author. We ſhall alſo obſerve, that this fact of the Hemicyclium of Verrius will anſwer ſome part of the Diſſertator's ſecond objection: "The Parian Chronicle is not an inſcription that might have been concealed in a private library." Why not? it is of no extraordinary bulk; and might formerly have been concealed in a private library, or in a private room, with as much eaſe as many inſcriptions are now concealed in very narrow ſpaces. But unleſs this monument were placed in ſome conſpicuous part of the iſland, and obtruded itſelf on the notice of every traveller, the wonder will in great meaſure ceaſe why it is never quoted by the ancients. Of the nine authors named in p. 109, had any one ever viſited Paros? If Pauſanias had travelled thither, and publiſhed his deſcription of the place, we might perhaps expect to find ſome mention of this marble in ſo curious and inquiſitive a writer. But though the inſcription exiſted, and were famous at Paros, there ſeems no neceſſity for any of the authors whoſe works are ſtill extant to have known or recorded it. If there be, let this learned antagoniſt point out the place where this mention ought to have been made. If any perſons were bound by a ſtronger obligation than others to ſpeak of the Parian inſcription, they muſt be the profeſſed chronologers; but alas! we have not the entire works of ſo much as a ſingle ancient chronologer: it is therefore impoſſible to determine whether this Chronicle were quoted by any ancient. And ſuppoſing it had been ſeen by ſome ancient, whoſe writings ſtill remain, why ſhould he make particular mention of it? Many authors, as we know from their remains, very freely copied their predeceſſors without naming them. Others, finding only a collection of bare events in the inſcription, without hiſtorical proofs or reaſons, might entirely neglect it, as deſerving no credit. Mr R. ſeems to lay much ſtreſs on the preciſe, exact, and particular ſpecification of the events, p. 109. But he ought to reflect, that this abrupt and poſitive method of ſpeaking is not only uſual, but neceſſary, in ſuch ſhort ſyſtems of chronology as the marble contains, where events only, and their dates, are ſet down, unaccompanied by any examination of evidences for and againſt, without ſtating any computation of probabilities, or deduction of reaſons. When therefore a chronological writer had undertaken to reduce the general hiſtory of Greece into a regular and conſiſtent ſyſtem, admitting that he was acquainted with this inſcription, what grounds have we to believe that he would ſay any thing about it? Either his ſyſtem coincided with the Chronicle or not: if it coincided, he would very probably diſdain to prop his own opinions with the unſupported aſſertions of another man, who, as far as he knew, was not better informed than himſelf. On the other hand, if he differed from the authority of the marble, he might think it a ſuperfluous exertion of complaiſance, to refute, by formal demonſtration, a writer who had choſen to give no reaſons for his own opinion. We ſhall paſs hence to

Objection VII. With reſpect to the parachroniſms that Mr R. produces, we ſhall without heſitation grant, that the author of the inſcription may have committed ſome miſtakes in his chronology, as perhaps concerning Phidon, whom he ſeems to have confounded with another of the ſame name, &c. But theſe miſtakes will not conclude againſt the antiquity of the inſcription, unleſs we at the ſame time reject many of the principal Greek and Roman writers, who have been convicted of ſimilar errors. We return therefore to

Objection VI. *Some of the facts ſeem to have been taken from authors of a later date.* We have endeavoured impartially to examine and compare the paſſages quoted in proof of this objection; but we are obliged to confeſs, that we do not perceive the fainteſt traces of theft or imitation. One example only deſerves to be excepted; to which we ſhall therefore pay particular attention.

"The names of ſix, and, if the lacunæ are properly ſupplied, the names of twelve cities, appear to have been engraved on the marble, exactly, as we find them in Ælian's Various Hiſtory. But there is not any imaginable reaſon for this particular arrangement. It does not correſpond with the time of their foundation, with their ſituation in Ionia, with their relative importance, or with the order in which they are placed by other eminent hiſtorians."

The chance of ſix names, ſays Mr R. being placed by two authors in the ſame order, is as 1 to 720; of 12, as 1 to 479,001,600. "It is therefore utterly improbable that theſe names would have been placed in this order on the marble, if the author of the inſcription had not tranſcribed them from the hiſtorian."

On this argument we ſhall obſerve, 1ſt, That the very contrary concluſion might poſſibly be juſt, that the hiſtorian tranſcribed from the inſcription. Yet we ſhall grant that in the preſent caſe this is improbable, eſpecially if the author of the Various Hiſtory be the ſame Ælian, who, according to Philoſtratus, Vit. Sophiſt. II. 31. never quitted Italy in his life. But an intermediate writer might have copied the marble, and Ælian might have been indebted to him. 2dly, We ſee no reaſon to allow, that the *lacunæ* are properly ſupplied. Suppoſe we ſhould aſſert, that the names ſtood originally thus: Miletus, Epheſus, Erythræ, Clazomene, Lebedos, Chios, Phocæa, Colophon, Myus, Priene, Samos, Teos. In this arrangement, only four names would be together in the ſame order with Ælian; and from theſe Miletus muſt be excepted, becauſe there is an obvious reaſon for mentioning that city firſt. Three only will then remain; and ſurely that is too ſlight a reſemblance to be conſtrued into an imitation. For Pauſanias and Paterculus, quoted by our author, p. 154, have both enumerated the ſame twelve cities, and both agree in placing the five laſt in the ſame order; nay, the ſix laſt, if Voſſius's conjecture that TEUM ought to be inſerted in Paterculus after Myum TEM, be as true as it is plauſible. But who imagines that Pauſanias had either opportunity or inclination to copy Paterculus? 3dly, Allowing that the names were engraved on the marble exactly in the order that Ælian has choſen, is there no way of ſolving the phenomenon but by ſuppoſing that one borrowed from the other? Seven authors at leaſt (Mr R. ſeems to ſay more, p. 154, 155.) mention the colonization of the ſame cities: how many authors now loſt may we reaſonably conjecture to have done the ſame? If therefore the compoſer of the Chronicle and Ælian lighted on the ſame authors, the former would probably preſerve the ſame arrangement that he found, becauſe in tranſcribing a liſt of names, he could have no temptation to deviate; and the latter would certainly adhere faithfully to his original, becauſe he is a notorious and ſervile plagiariſt. Mr R. indeed thinks, p. 158, that if a ſucceeding writer had borrowed the words of the inſcription, he would not have ſuppreſſed the name of the author. This opinion muſt fall to the ground, if it be ſhown that Ælian was accuſtomed to ſuppreſs the names of the authors to whom he was obliged. Ælian has given a liſt of fourteen celebrated gluttons; and, elſewhere, another of twenty-eight drunkards (from which, by the way, it appears, that people were apt to eat and drink rather too freely in ancient as well as modern times); and both theſe liſts contain exactly the ſame names in the ſame order with Atheneüs. Now it is obſervable, that fourteen names may be tranſpoſed 87,178,291,200 different ways, and that twenty-eight names admit of 304,888,344,611,713,860,501,504,000,000 different tranſpoſitions, &c. &c. Ælian therefore tranſcribed them from Atheneüs: yet Ælian never mentions Atheneüs in his Various Hiſtory. So that whether Ælian copied from the marble, or only drew from a common ſource, he might, and very probably would, conceal his authority.

VIII. *The hiſtory of the diſcovery of the Marbles is obſcure and unſatisfactory.*

In p. 169, it is ſaid to be "related with ſuſpicious circumſtances, and without any of thoſe clear and unequivocal evidences which always diſcriminate truth from falſehood." The queſtion is then finally decided. If the inſcription has not any of thoſe evidences which truth always poſſeſſes, and which falſehood always wants, it is moſt certainly forged. The learned diſſertator ſeems for a moment to have forgotten the modeſt character of a *doubter*, and to perſonate the dogmatiſt. But waving this, we ſhall add, that, as far as we can ſee, no appearance of fraud is diſcoverable in any part of the tranſaction. The hiſtory of many inſcriptions is related in a manner equally unſatisfactory; and if it could be clearly proved that the marble was dug up at Paros, what could be eaſier for a critic, who is determined at any rate to object, than to ſay, that it was buried there in order to be afterwards dug up? If the perſon who brought this treaſure to light had been charged on the ſpot with forging it, or concurring in the forgery, and had then refuſed to produce the external evidences of its authenticity, we ſhould have a right to queſtion, or perhaps to deny, that it was genuine. But no ſuch objection having been made or hinted, at the original time of its diſcovery, it is unreaſonable to require ſuch teſtimony as it is now impoſſible to obtain. "There is nothing ſaid of it in Sir T. Roe's negociations." What is the inference? That Sir Thomas knew nothing of it, or believed it to be ſpurious, or forged it, or was privy to the forgery? Surely nothing of this kind can be pretended. But let our author account for the circumſtance if he can. To us it ſeems of no conſequence on either ſide. "Piereſc made no effort to recover this precious relic; and from this compoſure he ſeems to have entertained ſome ſecret ſuſpicions of its authenticity." Piereſc would have had no chance of recovering it after it was in the poſſeſſion of Lord Arundel's agents. He was either a real or a pretended patron of letters; and it became him to affect to be pleaſed that the inſcription had come into England, and was illuſtrated by his learned friend Selden. John F. Gronovius had, with great labour and expence, collated Anna Comnena's Alexiades, and intended to publiſh them. While he was waiting for ſome other collation, they were intercepted, and the work was publiſhed by another. As ſoon as Gronovius heard this unpleaſant news, he anſwered, that learned men were engaged in a common cauſe; that if one prevented another in any publication, he ought rather to be thanked for lightening the burden, than blamed for interfering. But who would conclude from this anſwer, that Gronovius thought the Alexiades ſpurious, or not worthy of any regard?

Mr R. calculates, that the venders of the marble received 200 pieces. But here again we are left in the dark, unleſs we knew the preciſe value of theſe pieces. Perhaps they might be equal to an hundred of our pounds, perhaps only to fifty. Beſides, as they at firſt bargained with Samſon, Piereſc's ſuppoſed Jew agent, for fifty pieces only, they could not have forged the inſcription with the clear proſpect of receiving more; neither does it appear that they were paid by Samſon. It is fully as reaſonable to ſuppoſe fraud on the one ſide as on the other; and if Samſon, after having the marble in his poſſeſſion, refuſed or delayed to pay the ſum ſtipulated, he might, in conſequence of ſuch refuſal or delay, be thrown into priſon, and might, in revenge, damage the marble before the owners could recover it. We own this account of ours to be a romance; but it is lawful to combat romance with romance.

IX. *The world has been frequently impoſed upon by ſpurious books and inſcriptions; and therefore we ſhould be extremely cautious with regard to what we receive under the venerable name of antiquity.*

Much truth is obſervable in this remark. But the danger lies in applying ſuch general apophthegms to particular caſes. In the firſt place, it muſt be obſerved, that no forged books will exactly ſuit Mr R.'s purpoſe, but ſuch as pretend to be the author's own hand-writing; nor any inſcriptions, but ſuch as are ſtill extant on the original materials, or ſuch as were known to be extant at the time of their pretended diſcovery. Let the arguments be bounded by theſe limits, and the number of forgeries will be very much reduced. We are not in poſſeſſion of Cyriacus Anconitanus's book; but if we were governed by authority, we ſhould think that the teſtimony of Reineſius in his favour greatly overbalances all that Auguſtinus has ſaid to his prejudice. The opinion of Reineſius is of the more weight, becauſe he ſuſpects Urſinus of publiſhing counterfeit monuments. We likewiſe find the moſt eminent critics of the preſent age quoting Cyriacus without ſuſpicion (Vid. Ruhnken. in Timæi Lex. Plat. p. 10. aqud Koen, ad Gregor. p. 140). The doctrine advanced in the citation from Hardouin is exactly conformable to that writer's uſual paradoxes. He wanted to deſtroy the credit of all the Greek and Latin writers. But inſcriptions hung like a millſtone about the neck of his project. He therefore reſolved to make ſure work, and to deny the genuineneſs of as many as he ſaw convenient: to effect which purpoſe, he intrenches himſelf in a general accuſation. If the author of the diſſertation had quoted a few more paragraphs from Hardouin, in which he endeavours, after his manner, to ſhow the forgery of ſome inſcriptions, he would at once have adminiſtered the poiſon and the antidote. But to the reveries of that learned madman, reſpecting Greek ſuppoſititious compoſitions of this nature, we ſhall content ourſelves with oppoſing the ſentiments of a modern critic, whoſe judgment on the ſubject of ſpurious inſcriptions will not be diſputed. Maffei, in the introduction to the third book, c. 1. p. 51. of his admirable, though unfiniſhed, work, *de Arte Critica Lapidaria*, uſes theſe words: *Inſcriptionum Græce loquentium commentitias, ſi cum Latinis comparemus, deprehendi paucas; neque enim ullum omnino eſt, in tanta debacchantium falſariorum libidine, monumenti genus, in quod ii ſibi minus licere putaverint. Argumento eſt, pauciſſimas uſque in hanc diem ab eruditis viris, et in hoc literarum genere plurimum verſatis rejectas eſſe, falſique damnatas.*

Books of CHRONICLES, a canonical writing of the

Old Teſtament. It is uncertain which were written firſt, *The Books of Kings*, or *The Chronicles*, ſince they each refer to the other. However it be, the latter is often more full and comprehenſive than the former. Whence the Greek interpreters call theſe two books Παραλειπομενα, *Supplements*, *Additions*, or things omitted, becauſe they contain ſome circumſtances which are omitted in the other hiſtorical books. The Jews make but one book of the Chronicles, under the title of *Dibre-Haiamim*, i. e. *Journals* or *Annals*. Ezra is generally believed to be the author of theſe books. It is certain they were written after the end of the Babyloniſh captivity and the firſt year of the reign of Cyrus, of whom mention is made in the laſt chapter of the ſecond book.

The *Chronicles*, or *Paraleipomena*, are an abridgement of all the ſacred hiſtory, from the beginning of the Jewiſh nation to their firſt return from the captivity, taken out of thoſe books of the Bible which we ſtill have, and out of other annals which the author had then by him. The deſign of the writer was to give the Jews a ſeries of their hiſtory. The firſt book relates to the riſe and propagation of the people of Iſrael from Adam, and gives a punctual and exact account of the reign of David. The ſecond book ſets down the progreſs and end of the kingdom of Judah, to the very year of their return from the Babyloniſh captivity.

CHRONOGRAM, a ſpecies of falſe wit, conſiſting in this, that a certain date or epocha is expreſſed by numeral letters of one or more verſes; ſuch is that which makes the motto of a medal ſtruck by Guſtavus Adolphus in 1632:

ChrIſtVs DVX; ergo trIVMphVs.

CHRONOLOGY,

1 How divided.

TREATS of time, the method of meaſuring its parts, and adapting theſe, when diſtinguiſhed by proper marks and characters, to paſt tranſactions, for the illuſtration of hiſtory. This ſcience therefore conſiſts of two parts. The firſt treats of the proper meaſurement of time, and the adjuſtment of its ſeveral diviſions; the ſecond, of fixing the dates of the various events recorded in hiſtory, and ranging them according to the ſeveral diviſions of time, in the order in which they happened.

2 Chronology unknown to the ancients.

Chronology, comparatively ſpeaking, is but of modern date. The ancient poets appear to have been entirely unacquainted with it; and Homer, the moſt celebrated of them all, mentions nothing like a formal kalendar in any part of his writings. In the moſt early periods, the only meaſurement of time was by the ſeaſons, the revolutions of the ſun and moon; and many ages muſt have elapſed before the mode of computation by dating events came into general uſe. Several centuries intervened between the era of the Olympic games and the firſt hiſtorians; and ſeveral more between theſe and the firſt authors of chronology. When time firſt began to be reckoned, we find its meaſures very indeterminate. The ſucceſſion of Juno's prieſteſſes at Argos ſerved Hellanicus for the regulation of his narrative; while Ephorus reckoned his matters by generations. Even in the hiſtories of Herodotus and Thucydides, we find no regular dates for the events recorded: nor was there any attempt to eſtabliſh a fixed era, until the time of Ptolemy Philadelphus, who attempted it by comparing and correcting the dates of the Olympiads, the kings of Sparta, and the ſucceſſion of the prieſteſſes of Juno at Argos. Eratoſthenes and Apollodorus digeſted the events recorded by them, according to the ſucceſſion of the Olympiads and of the Spartan kings.

3 Inaccurate methods of computing time at firſt made uſe of.

The uncertainty of the meaſures of time in the moſt early periods renders the hiſtories of thoſe times equally uncertain; and even after the invention of dates and eras, we find the ancient hiſtorians very inattentive to them, and inaccurate in their computations. Frequently their eras and years were reckoned differently without their being ſenſible of it, or at leaſt without giving the reader any information concerning it; a circumſtance which has rendered the fragments of their works now remaining of very little uſe to poſterity. The Chaldean and Egyptian writers are generally acknowledged to be fabulous; and Strabo acquaints us, that Diodorus Siculus, and the other early hiſtorians of Greece, were ill-informed and credulous. Hence the diſagreement among the ancient hiſtorians, and the extreme confuſion and contradiction we meet with on comparing their works. Hellanicus and Acuſilaus diſagreed about their genealogies; the latter rejected the traditions of Heſiod. Timæus accuſed Ephorus of falſehood, and the reſt of the world accuſed Timæus. The moſt fabulous legends were impoſed on the world by Herodotus; and even Thucydides and Diodorus, generally accounted able hiſtorians, have been convicted of error. The chronology of the Latins is ſtill more uncertain. The records of the Romans were deſtroyed by the Gauls; and Fabius Pictor, the moſt ancient of their hiſtorians, was obliged to borrow the greateſt part of his information from the Greeks. In other European nations the chronology is ſtill more imperfect and of a later date; and even in modern times, a conſiderable degree of confuſion and inaccuracy has ariſen from want of attention in the hiſtorians to aſcertain the dates and epochs with preciſion.

4 Ancient hiſtorians not to be credited.

5 Utility of chronology, liſt of chronologers, &c.

From theſe obſervations it is obvious how neceſſary a proper ſyſtem of chronology muſt be for the right underſtanding of hiſtory, and likewiſe how very difficult it muſt be to eſtabliſh ſuch a ſyſtem. In this, however, ſeveral learned men have excelled, particularly Julius Africanus, Euſebius of Cæſarea, George Cyncelle, John of Antioch, Dennis, Petau, Cluviar, Calviſius, Uſher, Simſon, Marſham, Blair, and Playfair. It is founded, 1. On aſtronomical obſervations, particularly of the eclipſes of the ſun and moon, combined with the calculations of the eras and years of different nations. 2. The teſtimonies of credible authors. 3. Thoſe epochs in hiſtory which are ſo well atteſted and determined, that they have never been controverted.

verted. 4. Ancient medals, coins, monuments, and inſcriptions. None of theſe, however, can be ſufficiently intelligible without an explanation of the firſt part, which, we have already obſerved, conſiders the diviſions of time, and of which therefore we ſhall treat in the firſt place.

6
Of the diviſion of time into days.

The moſt obvious diviſion of time is derived from the apparent revolutions of the celeſtial bodies, particularly of the ſun, which by the viciſſitudes of day and night becomes evident to the moſt barbarous and ignorant nations. In ſtrict propriety of ſpeech, the word *day* ſignifies only that portion of time during which the ſun diffuſes light on any part of the earth; but in the moſt comprehenſible ſenſe, it includes the night alſo, and is called by chronologers a *civil* day; by aſtronomers a *natural*, and ſometimes an *artificial* day.

7
Civil, ſolar, &c. days defined.

By a civil day is meant the interval betwixt the ſun's departure from any given point in the heavens and next return to the ſame, with as much more as anſwers to its diurnal motion eaſtward, which is at the rate of 59 minutes and 8 ſeconds of a degree, or 3 minutes and 57 ſeconds of time. It is alſo called a *ſolar* day, and is longer than a *ſidereal* one, inſomuch that, if the former be divided into 24 equal parts or hours, the latter will conſiſt only of 23 hours 56 minutes. The apparent inequality of the ſun's motion, likewiſe, ariſing from the obliquity of the ecliptic, produces another inequality in the length of the days: and hence the difference betwixt real and apparent time, ſo that the apparent motion of the ſun cannot always be a true meaſure of duration. Thoſe inequalities, however, are capable of being reduced to a general ſtandard, which furniſhes an exact meaſure throughout the year; whence ariſes the difference between mean and apparent time, as is explained under the article ASTRONOMY.

8
Different ways of computing the beginning of the day.

There have been very conſiderable differences among nations with regard to the beginning and ending of their days. The beginning of the day was counted from ſunriſe by the Babylonians, Syrians, Perſians, and Indians. The civil day of the Jews was begun from ſunriſe, and their ſacred one from ſunſet; the latter mode of computation being followed by the Athenians, Arabs, ancient Gauls and other European nations. According to ſome, the Egyptians began their day at ſunſet, while others are of opinion that they computed from noon or from ſunriſe: and Pliny informs us that they computed their civil day from one midnight to another. It is probable, however, that they had different modes of computation in different provinces or cities. The Auſonians, the moſt ancient inhabitants of Italy, computed the day from midnight; and the aſtronomers of Cathay and Oighur in the Eaſt Indies reckoned in the ſame manner. This mode of computation was adopted by Hipparchus, Copernicus, and other aſtronomers, and is now in common uſe among ourſelves. The *aſtronomical* day, however, as it is called, on account of its being uſed in aſtronomical calculations, commences at noon, and ends at the ſame time the following day. The Mahometans reckon from one twilight to another. In Italy, the civil day commences at ſome indeterminate point after ſunſet; whence the time of noon varies with the ſeaſon of the year. At the ſummer ſolſtice, the clock ſtrikes 16 at noon, and 19 at the time of the winter ſolſtice. Thus alſo the length of each day differs by ſeveral minutes from that immediately preceding or following it. This variation requires a conſiderable difficulty in adjuſting their time by clocks. It is accompliſhed, however, by a ſudden movement which corrects the difference when it amounts to a quarter of an hour; and this it does ſometimes at the end of eight days, ſometimes at the end of 15, and ſometimes at the end of 40. Information of all this is given by a printed kalendar, which announces, that from the 16th of February, for inſtance, to the 24th, it will be noon at a quarter paſt 18; from the 24th of February to the 6th of March, it will be noon at 18 o'clock preciſely; from the firſt of June to the 13th of July, the hour of noon will be at 16 o'clock; on the 13th of July it will be at half an hour after 16; and ſo on throughout the different months of the year. This abſurd method of meaſuring the day continues, notwithſtanding ſeveral attempts to ſuppreſs it, throughout the whole of Italy, a few provinces only excepted.

9
Strange method of computation in Italy.

10
Various ſubdiviſions of the day.

The ſubdiviſions of the day have not been leſs various than the computations of the day itſelf. The moſt obvious diviſion, and which could at no time, nor in no age, be miſtaken, was that of morning and evening. In proceſs of time the two intermediate points of noon and midnight were determined; and this diviſion into quarters was in uſe long before the invention of hours.

From this ſubdiviſion probably aroſe the method uſed by the Jews and Romans of dividing the day and night into four vigils or watches. The firſt began at ſunriſing, or ſix in the morning; the ſecond at nine; the third at twelve; and the fourth at three in the afternoon. In like manner the night was divided into four parts; the firſt beginning at ſix in the evening, the ſecond at nine, the third at twelve, and the fourth at three in the morning. The firſt of theſe diviſions was called by the Jews the *third* hour of the day; the ſecond the *ſixth*; the third the *ninth*; and the fourth the *twelfth*, and ſometimes the *eleventh*. Another diviſion in uſe, not only among the nations above mentioned, but the Greeks alſo, was that which reckoned the firſt quarter from ſunſet to midnight; the ſecond from midnight to ſunriſe; the third, or morning watch, from morning to noon; and the fourth from noon to ſunſet.

11
Invention of hours uncertain.

It is uncertain at what time the more minute ſubdiviſion of the day into hours firſt commenced. It does not appear from the writings of Moſes that he was acquainted with it, as he mentions only the morning, mid-day, evening, and ſunſet. Hence we may conclude, that the Egyptians at that time knew nothing of it, as Moſes was well ſkilled in their learning. According to Herodotus, the Greeks received the knowledge of the twelve hours of the day from the Babylonians. It is probable, however, that the diviſion was actually known and in uſe before the name *hour* was applied to it; as Cenſorinus informs us that the term was not made uſe of in Rome for 300 years after its foundation; nor was it known at the time the twelve tables were conſtructed.

The eaſtern nations divide the day and night in a very ſingular manner; the origin of which is not eaſily diſcovered. The Chineſe have five watches in the night, which are announced by a certain number of ſtrokes on a bell or drum. They begin by giving one ſtroke, which is anſwered by another; and this is repeated at the diſtance of a minute or two, until the ſecond watch begin, which is announced by two ſtrokes; and ſo on throughout the reſt of the watches. By the ancient Tartars, Indians, and Perſians, the day was divided into eight parts, each of which contained ſeven hours and a half.

12
Method of computation on the coaſt of Malabar.

The Indians on the coaſt of Malabar divide the day into ſix parts, called *najika*; each of theſe ſix parts is ſubdivided into 60 others, called *venaigas*; the venaiga into 60 *birpes*; the birpe into 10 *kenikans*; the kenikan into four *mattires*; the mattire into eight *kaunimas* or *caignodes*; which diviſions, according to our mode of computation, ſtand as follow:

Najika,	Venaiga,	Birpe,	Kenikan,	Mattire,	Caignode.
24 min.	24 ſec.	4 ſec.	$\frac{2}{5}$ ſec.	$\frac{1}{10}$ ſec.	$\frac{1}{80}$ ſec.

The day of the Chineſe is begun at midnight, and ends with the midnight following. It is divided into twelve hours, each diſtinguiſhed by a particular name and figure. They alſo divide the natural day into 100 parts, and each of theſe into 100 minutes; ſo that the whole contains 10,000 minutes. In the northern parts of Europe, where only two ſeaſons are reckoned in the year, the diviſions of the day and night are conſiderably larger than with us. In Iceland the 24 hours are divided into eight parts; the firſt of which commences at three in the morning; the ſecond at five; the third at half an hour after eight; the fourth at eleven; the fifth at three in the afternoon; the ſixth at ſix in the evening; the ſeventh at eight, and the laſt at midnight. In the eaſtern part of Turkeſtan, the day is divided into twelve equal parts, each of which is diſtinguiſhed by the name of ſome animal. Theſe are ſubdivided into eight *keh*; ſo that the whole 24 hours contain 96 *keh*.

13
Diviſions of the hour into minutes, &c.

The modern diviſions of the hour in uſe among us are into minutes, ſeconds, thirds, fourths, &c. each being a ſixtieth part of the former ſubdiviſion. By the Chaldeans, Jews, and Arabians, the hour is divided into 1080 ſcruples; ſo that one hour contains 60 minutes, and one minute 18 ſcruples. The ancient Perſians and Arabs were likewiſe acquainted with this diviſion; but the Jews are ſo fond of it, that they pretend to have received it in a ſupernatural manner. "Iſſachar (ſay they) aſcended into heaven, and brought from thence 1080 parts for the benefit of the nation."

14
Methods of announcing the hours.

The diviſion of the day being aſcertained, it ſoon became an object to indicate in a public manner the expiration of any particular hour or diviſion; as without ſome general knowledge of this kind, it would be in a great meaſure impoſſible to carry on buſineſs. The methods of announcing this have been likewiſe very different. Among the Egyptians it was cuſtomary for the prieſts to proclaim the hours like watchmen among us. The ſame method was followed at Rome; nor was there any other method of knowing the hours until the year 293 B. C. when Papirius Curſor firſt ſet up a ſun dial in the Capitol. A ſimilar method is practiſed among the Turks, whoſe prieſts proclaim from the top of their moſques, the cock-crowing, day-break, mid-day, three o'clock in the afternoon, and twilight, being their appointed times of worſhip.

15
Invention of inſtruments for this purpoſe.

As this mode of proclaiming the hour could not but be very inconvenient, as well as imperfect, the introduction of an inſtrument which every one could have in his poſſeſſion, and which might anſwer the ſame purpoſe, muſt have been conſidered as a valuable acquiſition. One of the firſt of theſe was the clepſydra or water-clock *. Various kinds of theſe were in uſe among the Egyptians at a very early period. The invention of the inſtrument is attributed to Thoth or Mercury, and it was afterwards improved by Cteſibius of Alexandria. It was a common meaſure of time among the Greeks, Indians, and Chaldeans, as well as the Egyptians, but was not introduced into Rome till the time of Scipio Naſica. The Chineſe aſtronomers have long made uſe of it, and by its means divided the zodiac into twelve parts; but it is a very inaccurate meaſure of time, varying, not only according to the quantity of water in the veſſel, but according to the ſtate of the atmoſphere.

The clepſydra was ſucceeded by the gnomon or ſun-dial.—This at firſt was no more than a ſtile erected perpendicularly to the horizon; and it was a long time before the principles of it came to be thoroughly underſtood. The invention is with great probability attributed to the Babylonians, from whom the Jews received it before the time of Ahaz, when we know that a ſun-dial was already erected at Jeruſalem. The Chineſe and Egyptians alſo were acquainted with the uſe of the dial at a very early period, and it was conſiderably improved by Anaximander or Anaximenes; one of whom is for that reaſon looked upon to be the inventor. Various kinds of dials, however, were invented and made uſe of in different nations long before their introduction at Rome. The firſt erected in that city, as has been already mentioned, was that by Papirius Curſor; and 30 years after, Valerius Meſſala brought one from Sicily, which was uſed in Rome for no leſs than 99 years, though conſtructed for a Sicilian latitude, and conſequently incapable of ſhowing the hours exactly in any other place; but at laſt another was conſtructed by L. Philippus, capable of meaſuring time with greater accuracy.

It was long after the invention of dials before mankind began to form any idea of clocks; nor is it well known at what period they were firſt invented. A clock was ſent by Pope Paul I. to Pepin king of France, which at that time was ſuppoſed to be the only one in the world. A very curious one was alſo ſent to Charles the Great from the caliph Haroun Alraſchid, which the hiſtorians of the time ſpeak of with ſurpriſe and admiration: but the greateſt improvement was that of Mr Huygens, who added the pendulum to it. Still, however, the inſtruments for dividing time were found to be inaccurate for nice purpoſes. The expanſion of the materials by heat, and their contraction by cold, would cauſe a very perceptible alteration in the going of an inſtrument in the ſame place at different times of the year, and much more if carried from one climate to another. Various methods have been contrived to correct this; which indeed can be done very effectually at land by a certain conſtruction of the pendulum; but at ſea, where a pendulum cannot be uſed, the inaccuracy is of conſequence much greater: nor was it thought poſſible to correct the errors ariſing from theſe cauſes in any tolerable degree, until the late invention of Mr Harriſon's time-piece, which may be conſidered as making perhaps as near an approach to perfection as poſſible.

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* See *Clepſyдra*.

Having thus given an account of the more minute diviſions of time, with the methods of meaſuring them, we muſt now proceed to the larger; which more properly belong to chronology, and which muſt be kept on record, as no inſtrument can be made to

16 Of weeks.

point them out. Of theſe the diviſion into weeks of ſeven days is one of the moſt ancient, and probably took place from the creation of the world. Some, indeed, are of opinion, that the week was invented ſome time after for the more convenient notation of time; but whatever may be in this, we are certain that it is of the higheſt antiquity, and even the moſt rude and barbarous nations have made uſe of it. It is ſingular indeed that the Greeks, notwithſtanding their learning, ſhould have been ignorant of this diviſion; and M. Goguet informs us, that they were almoſt the only nation who were ſo. By them the month of 30 days was divided into three times 10, and the days of it named accordingly. Thus the 15th day of the month was called the *ſecond fifth*, or fifth of the ſecond tenth; the 24th was called the *third fourth*, or the fourth day of the third tenth. This method was in uſe in the days of Heſiod, and it was not until ſeveral ages had elapſed, that the uſe of weeks was received into Greece from the Egyptians. The inhabitants of Cathay, in the northern parts of China, were likewiſe unacquainted with the week of ſeven days, but divided the year into ſix parts of 60 days each. They had alſo a cycle of 15 days, which they uſed as a week. The week was likewiſe unknown to the ancient Perſians and to the Mexicans; the former having a different name for every day of the month, and the latter making uſe of a cycle of 13 days. By almoſt all other nations the week of ſeven days was adopted.

17 Of holidays. It is remarkable, that one day in the week has always been accounted as ſacred by every nation. Thus Saturday was conſecrated to pious purpoſes among the Jews, Friday by the Turks, Tueſday by the Africans of Guinea, and Sunday by the Chriſtians. Hence alſo the origin of *Feriæ* or holidays, frequently made uſe of in Syſtems of Chronology; and which aroſe from the following circumſtance. In the church of Rome the old eccleſiaſtical year began with Eaſter week; all the days of which were called *Feriæ* or *Feriata*, that is, holy, or ſacred days; and in proceſs of time the days of other weeks came to be diſtinguiſhed by the ſame appellation, for the two following reaſons, 1. Becauſe every day ought to be holy in the eſtimation of a Chriſtian. 2. Becauſe all days are holy to eccleſiaſtics, whoſe time ought to be entirely devoted to religious worſhip.—The term *week* is ſometimes uſed to ſignify ſeven years, not only in the prophetical writings, but likewiſe by profane authors: thus Varro, in his book inſcribed *Hebdomades*, informs us, that he had then entered the 12th week of his years.

18 Of months. The next diviſion of time ſuperior to weeks, is that of *months*. This appears to have been, if not coeval with the creation, at leaſt in uſe before the flood. As this diviſion is naturally pointed out by the revolution of the moon, the months of all nations were originally lunar; until after ſome conſiderable advances had been made in ſcience, the revolutions of that luminary were compared with the ſun, and thus the limits of the month fixed with greater accuracy. The diviſion of the year into 12 months, as being founded on the number of full revolutions of the moon in that time, has alſo been very general; though Sir John Chardin informs us, that the Perſians divided the year into 24 months; and the Mexicans into 18 months of 20 days each. The months generally contained 30 days, or 29 and 30 days alternately; though this rule was far from being without exception. The months of the Latins conſiſted of 16, 18, 22, or 36 days; and Romulus gave his people a year of 10 months and 304 days. The Kamſchatkadales divide the year into 10 months; reckoning the time proper for labour to be nine months, and the winter ſeaſon, when they are obliged to remain inactive, only as one month.

It has been a very ancient cuſtom to give names to the different months of the year, though this appears to have been more modern than the departure of the Iſraelites out of Egypt, as they would otherwiſe undoubtedly have carried it with them; but for a conſiderable time after their ſettlement in Canaan, they diſtinguiſhed the months only by the names of firſt, ſecond, &c. After their return from the Babyloniſh captivity, they adopted the names given to the months by the Chaldeans. Other nations adopted various names, and arranged the months themſelves according to their fancy. From this laſt circumſtance ariſes the variety in the dates of the months; for as the year has been reckoned from different ſigns in the ecliptic, neither the number nor the quantity of months have been the ſame, and their ſituation has likewiſe been altered by the intercalations neceſſary to be made.

Theſe intercalations became neceſſary on account of the exceſs of the ſolar above the lunar year; and the months compoſed of intercalary days are likewiſe called *emboliſmal*. Theſe emboliſmal months are either *natural* or *civil*. By the former the ſolar and lunar years are adjuſted to one another; and the latter ariſes from the defect of the civil year itſelf. The *ador* of the Jews, which always conſiſts of 30 days, is an example of the natural emboliſmal month.

The Romans had a method of dividing their months into kalends, nones, and ides. The firſt was derived from an old word *calo*, "to call;" becauſe, at every new moon, one of the lower claſs of prieſts aſſembled the people, and called over, or announced, as many days as intervened betwixt that and the nones, in order to notify the difference of time and the return of feſtivals. The 2d, 3d, 4th, 5th, 6th, and 7th of March, May, July, and October, were the nones of theſe months; but in the other months were the 2d, 3d, 4th, and 5th days only. Thus the 5th of January was its nones; the 4th was *pridie nonarum*; the 3d, *tertio nonarum*, &c. The ides contained eight days in every month, and were nine days diſtant from the nones. Thus the 15th day of the four months already mentioned was the ides of them; but in the others the 13th was accounted as ſuch; the 12th was *pridie iduum*, and the 11th *tertio iduum*. The ides were ſucceeded by the kalends; the 14th of January, for inſtance, being the 19th kalend of February; the 15th was the 18th kalend; and ſo on till the 31ſt of January, which was *pridie kalendarum*; and February 1ſt was the kalends.

19
Aſtronomical and civil months.

Among the European nations the month is either aſtronomical or civil. The former is meaſured by the motion of the heavenly bodies; the civil conſiſts of a certain number of days ſpecified by the laws, or by the civil inſtitutions of any nation or ſociety. The aſtronomical months, being for the moſt part regulated by the motions of the ſun and moon, are thus divided into ſolar and lunar, of which the former is ſometimes alſo called *civil*. The aſtronomical ſolar month is the time which the ſun takes up in paſſing through a ſign of the ecliptic. The lunar month is periodical, ſynodical, ſidereal, and civil. The ſynodical lunar month is the time that paſſes between any conjunction of the moon with the ſun and the conjunction following. It includes the motion of the ſun eaſtward during that time; ſo that a mean lunation conſiſts of 29d. 12h. 44′ 2″ 8921. The ſidereal lunar month is the time of the mean revolution of the moon with regard to the fixed ſtars. As the equinoctial points go backwards about 4′ in the ſpace of a lunar month, the moon muſt, in conſequence of this retroceſſion, arrive at the equinox ſooner than at any fixed ſtar, and conſequently the mean ſidereal revolution muſt be longer than the mean periodical one. The latter conſiſts of 27d. 7h. 43′ 4″ 6840. The civil lunar month is computed from the moon, to anſwer the ordinary purpoſes of life; and as it would have been inconvenient, in the computation of lunar months, to have reckoned odd parts of days, they have been compoſed of 30 days, or of 29 and 30 alternately, as the neareſt round numbers. When the month is reckoned from the firſt appearance of the moon after her conjunction, it is called the *month of illumination*. The Arabs, Turks, and other nations, who uſe the era of the Hegira, follow this method of computation. As twelve lunar months, however, are 11 days leſs than a ſolar year, Julius Cæſar ordained that the month ſhould be reckoned from the courſe of the ſun, and not of the moon; and that they ſhould conſiſt of 30 and 31 days alternately, February only excepted, which was to conſiſt of 28 commonly, and of 29 in leap-years.

20
Of years.

The higheſt natural diviſion of time is into years. At firſt, however, it is probable that the courſe of the ſun through the ecliptic would not be obſerved, but that all nations would meaſure their time by the revolutions of the moon. We are certain, at leaſt, that the Egyptian year conſiſted originally of a ſingle lunation; though at length it included two or three months, and was determined by the ſtated returns of the ſeaſons. As the eaſtern nations, however, particularly the Egyptians, Chaldeans, and Indians, applied themſelves in very early periods to aſtronomy, they found, by comparing the motions of the ſun and moon together, that one revolution of the former included nearly 12 of the latter. Hence a year of 12 lunations was formed, in every one of which were reckoned 30 days; and hence alſo the diviſion of the ecliptic into 360 degrees. The luniſolar year, conſiſting of 360 days, was in uſe long before any regular intercalations were made; and hiſtorians inform us, that the year of all ancient nations was luniſolar. Herodotus relates, that the Egyptians firſt divided the year into 12 parts by the aſſiſtance of the ſtars, and that every part conſiſted of 30 days. The Thebans corrected this year by adding five intercalary days to it. The old Chaldean year was alſo reformed by the Medes and Perſians: and ſome of the Chineſe miſſionaries have informed us, that the luniſolar year was alſo corrected in China; and that the ſolar year was aſcertained in that country to very conſiderable exactneſs. The Latin year, before Numa's correction of it, conſiſted of 360 days, of which 304 were divided into ten months; to which were added two private months not mentioned in the kalendar.

21
Explanation of a paſſage in Herodotus.

The imperfection of this method of comparing time is now very evident. The luniſolar year was about $5\frac{1}{4}$ days ſhorter than the true ſolar year, and as much longer than the lunar. Hence the months could not long correſpond with the ſeaſons; and even in ſo ſhort a time as 34 years, the winter months would have changed places with thoſe of ſummer. From this rapid variation, Mr Playfair takes notice, that a paſſage in Herodotus, by which the learned have been exceedingly puzzled, may receive a ſatisfactory ſolution, viz. that "in the time of the ancient Egyptian kings, the ſun had twice ariſen in the place where it had formerly ſet, and twice ſet where it had ariſen." By this he ſuppoſes it is meant, "that the beginning of the year had twice gone through all the ſigns of the ecliptic; and that the ſun had riſen and ſet twice in every day and month in the year." This, which ſome have taken for a proof of moſt extravagant antiquity, he further obſerves, might have happened in 138 years only; as in that period there would be a difference of nearly two years between the ſolar and lunar year. Such evident imperfections could not but produce a reformation everywhere; and accordingly we find that there was no nation which did not adopt the method of adding a few intercalary days at certain intervals. We are ignorant, however, of the perſon who was the firſt inventor of this method. The Theban prieſts attributed the invention to Mercury or Thoth; and it is certain that they were acquainted with the year of 365 days at a very early period. The length of the ſolar year was repreſented by the celebrated golden circle of Oſymandyas of 365 cubits circumference; and on every cubit of which was inſcribed a day of the year, together with the heliacal riſings and ſettings of the ſtars. That monarch is ſuppoſed to have reigned in the 11th or 12th century before the Chriſtian era.

22
Great Egyptian year, or canicular cycle.

The Egyptain ſolar year being almoſt ſix hours ſhorter than the true one, this inaccuracy, in proceſs of time, produced another revolution; ſome circumſtances attending which ſerve to fix the date of the diſcovery of the length of the year, and which, from the above deſcription of the golden circle, we may ſuppoſe to have been made during the reign of Oſymandyas. The inundation of the Nile was annually announced by the heliacal riſing of Sirius, to which the reformers of the kalendar adjuſted the beginning of the year, ſuppoſing that it would remain immoveable. In a number of years, however, it appeared that their ſuppoſitions

tions of this were ill founded. By reaſon of the inequality above mentioned, the heliacal riſing of Sirius gradually advanced nearly at the rate of one day in four years; ſo that in 1461 years it completed a revolution, by ariſing on every ſucceeding day of the year, and returning to the point originally fixed for the beginning of the year. This period, equal to 1460 Julian years, was termed the *great Egyptian year*, or *canicular cycle*.

23
Of the time when it commenced.

From the accounts we have of the time that the canicular cycle was renewed, the time of its original commencement may be gathered with tolerable certainty. This happened, according to Cenſorinus, in the 138th year of the Chriſtian era. Reckoning backward therefore from this time for 1460 years, we come to the year B. C. 1322, when the ſun was in Cancer, about 14 or 15 days after the ſummer ſolſtice, which happened on July 5th. The Egyptians uſed no intercalation till the time of Auguſtus, when the corrected Julian year was received at Alexandria by his order; but even this order was obeyed only by the Greeks and Romans who reſided in that city; the ſuperſtitious natives refuſing to make any addition to the length of a year which had been ſo long eſtabliſhed among them.

24
Uncertainty of the time when the true ſolar year was diſcovered.

We are not informed at what preciſe period the true year was obſerved to conſiſt of nearly ſix hours more than the 365 days. Though the prieſts of Thebes claim the merit of the diſcovery, Herodotus makes no mention of it; neither did Thales, who introduced the year of 365 days into Greece, ever uſe any intercalation. Plato and Eudoxus are ſaid to have obtained it as a ſecret from the Egyptians about 80 years after Herodotus, and to have carried it into Greece; which ſhowed, that the knowledge of this form of the year was at that time recent, and only known to a few learned men.

25
Years of the Jews, &c.

The year of the ancient Jews was luniſolar; and we are informed by tradition, that Abraham preſerved in his family, and tranſmitted to poſterity, the Chaldean form of the year, conſiſting of 360 days; which remained the ſame without any correction until the date of the Era of Nabonaſſar. The ſolar year was adopted among them after their return from the Babyloniſh captivity; but when ſubjected to the ſucceſſors of Alexander in Syria, they were obliged to admit the lunar year into their kalendar. In order to adjuſt this year to the courſe of the ſun, they added at certain periods a month to Adar, formerly mentioned, and called it *Ve Adar*. They compoſed alſo a cycle of 19 years, in ſeven of which they inſerted the intercalary month. This correction was intended to regulate the months in ſuch a manner, as to bring the 15th of Niſan to the equinoctial point; and likewiſe the courſes of the ſeaſons and feaſts in ſuch a manner, that the corn might be ripe at the paſſover as the law required.

26
Reformation of the kalendar by Julius Cæſar and Pope Gregory.

We ſhall not take up the reader's time with any further account of the years made uſe of by different nations, all of which are reſolved at laſt into the luniſolar; it will be ſufficient to mention the improvements in the kalendar made by the two great reformers of it, Julius Cæſar, and Pope Gregory XIII. The inſtitution of the Roman year by Romulus has been already taken notice of; but as this was evidently very imperfect, Numa, on his advancement to the throne, undertook to reform it. With a deſign to make a complete lunar year of it, he added 50 days to the 304 of Romulus; and from every one of his months, which conſiſted of 31 and 30 days, he borrowed one day. Of theſe additional days he compoſed two months; calling the one January, and the other February. Various other corrections and adjuſtments were made; but when Julius Cæſar obtained the ſovereignty of Rome, he found that the months had conſiderably receded from the ſeaſons to which Numa had adjuſted them. To bring them forward to their places, he formed a year of 15 months, or 445 days; which, on account of its length, and the deſign with which it was formed, has been called the *year of confuſion*. It terminated on the firſt of January 45 B. C. and from this period the civil year and months were regulated by the courſe of the ſun. The year of Numa being ten days ſhorter than the ſolar year, two days were added by Julius to every one of the months of January, Auguſt, and December; and one to April, June, September, and November. He ordained likewiſe, that an intercalary day ſhould be added every fourth year to the month of February, by reckoning the 24th day, or ſixth of the kalends of March, twice over. Hence this year was ſtyled *biſſextile*, and alſo *leap year*, from its leaping a day more than a common year.

The Julian year has been uſed by modern chronologers, as being a meaſure of time extremely ſimple and ſufficiently accurate. It is ſtill, however, ſomewhat imperfect, for as the true ſolar year conſiſts of 365d. 5h. 48′ 45½″, it appears that in 131 years after the Julian correction, the ſun muſt have arrived one day too ſoon at the equinoctial point. During Cæſar's reign the vernal equinox had been obſerved by Soſigenes on the 25th of March; but by the time of the Nicean council it had gone backward to the 21ſt. The cauſe of the error was not then known; but in 1582, when the equinox happened on the 11th of March, it was thought proper to give the kalendar its laſt correction. Pope Gregory XIII. having invited to Rome a conſiderable number of mathematicians and aſtronomers, employed ten years in the examination of their ſeveral formulæ, and at laſt gave the preference to that of Aloſia and Antoninus Lelius, who were brothers. Ten days were now cut off in the month of October, and the 4th of that month was reckoned the 15th. To prevent the ſeaſons from receding in time to come, he ordained that one day ſhould be added every fourth or biſſextile year as before; and that the 1600th year of the Chriſtian era, and every fourth century thereafter, ſhould be a biſſextile or leap year. One day therefore is to be intercalated in the years 2000, 2400, 2800, &c. but in the other centuries, as 1700, 1800, 1900, 2100, &c. it is to be ſuppreſſed, and theſe are to be reckoned as common years. Even this correction, however, is not abſolutely exact; but the error muſt be very inconſiderable, and ſcarce amounting to a day and a half in 5000 years.

28
Commenc
ment of tl
year.

The commencement of the year has been determined by the date of ſome memorable event or occurrence, ſuch as the creation of the world, the univerſal deluge, a conjunction of planets, the incarnation of our Saviour, &c. and of courſe has been referred to different points in the ecliptic. The Chaldean and the Egyptian years were dated from the autumnal equinox. The eccleſiaſtical year of the Jews began in the ſpring; but, in civil affairs, they retained the epoch of the Egyptian year. The ancient Chineſe reckoned from the new moon neareſt to the middle of Aquarius; but, according to ſome recent accounts, the beginning of their year was transferred (B. C. 1740.) to the new moon neareſt to the winter ſolſtice. This likewiſe is the date of the Japaneſe year. Diemſchid, or Gemſchid, king of Perſia, obſerved, on the day of his public entry into Perſepolis, that the ſun entered into Aries. In commemoration of this fortunate event and coincidence, he ordained the beginning of the year to be removed from the autumnal to the vernal equinox. This epoch was denominated *Neuruz*, viz. new-day; and is ſtill celebrated with great pomp and feſtivity. (See Epochs.) The ancient Swediſh year commenced at the winter ſolſtice, or rather at the time of the ſun's appearance in the horizon, after an abſence of about 40 days. The feaſt of this epoch was ſolemnized on the 20th day after the ſolſtice. Some of the Grecian ſtates computed from the vernal, ſome from the autumnal equinox, and others from the ſummer tropic. The year of Romulus commenced in March, and that of Numa in January. The Turks and Arabs date the year from the 16th of July: and the American Indians reckon from the firſt appearance of the new mon of the vernal equinox. The church of Rome has fixed new year's day on the Sunday that correſponds with the full moon of the ſame ſeaſon. The Venetians, Florentines, and Piſans in Italy, and the inhabitants of Treves in Germany, begin the year at the vernal equinox. The ancient clergy reckoned from the 25th of March; and this method was obſerved in Britain, until the introduction of the new ſtyle (A. D. 1752); after which our year commenced on the 1ſt day of January.

26
Of Cycles.

Beſides theſe natural diviſions of time ariſing immediately from the revolutions of the heavenly bodies, there are others formed from ſome of the leſs obvious conſequences of theſe revolutions, which are called *cycles*, from the Greek κυκλος, *a circle*. The moſt remarkable of theſe are the following.

1. The *cycle of the ſun* is a revolution of 28 years, in which time the days of the months return again to the ſame days of the week; the ſun's place to the ſame ſigns and degrees of the ecliptic on the ſame months and days, ſo as not to differ one degree in 100 years; and the leap-years begin the ſame courſe over again with reſpect to the days of the week on which the days of the months fall. 27 Golden number. The *cycle of the moon*, commonly called the *golden number*, is a revolution of 19 years; in which time, the conjunctions, oppoſitions, and other aſpects of the moon, are within an hour and a half of being the ſame as they were on the ſame days of the months 19 years before. The *indiction* is a revolution of 15 years, uſed only by the Romans for indicating the times of certain payments made by the ſubjects to the republic: It was eſtabliſhed by Conſtantine, A. D. 312.

28
To find the year of any cycle.

The year of our Saviour's birth, according to the vulgar era, was the 9th year of the ſolar cycle, the firſt year of the lunar cycle; and the 312th year after his birth was the firſt year of the Roman indiction. Therefore, to find the year of the ſolar cycle, add 9 to any given year of Chriſt, and divide the ſum by 28, the quotient is the number of cycles elapſed ſince his birth, and the remainder is the cycle for the given year: If nothing remains, the cycle is 28. To find the lunar cycle, add one to the given year of Chriſt, and divide the ſum by 19; the quotient is the number of cycles elapſed in the interval, and the remainder is the cycle for the given year: If nothing remains the cycle is 19. Laſtly, ſubtract 312 from the given year of Chriſt, and divide the remainder by 15; and what remains after this diviſion is the indiction for the given year: If nothing remains, the indiction is 15.

29
Variation of the golden numbers.

Although the above deficiency in the lunar circle of an hour and an half every 19 years be but ſmall, yet in time it becomes ſo ſenſible as to make a whole natural day in 310 years. So that, although the cycle be of uſe, when the golden numbers are rightly placed againſt the days of the month in the kalendar, as in the Common Prayer Books, for finding the days of the mean conjunctions or oppoſitions of the ſun and moon, and conſequently the time of Eaſter; it will only ſerve for 310 years, old ſtyle. For as the new and full moons anticipate a day in that time, the golden numbers ought to be placed one day earlier in the kalendar for the next 310 years to come. Theſe numbers were rightly placed againſt the days of new moon in the kalendar, by the council of Nice, A. D. 325; but the anticipation, which has been neglected ever ſince, is now grown almoſt into five days: And therefore all the golden numbers ought now to be placed five days higher in the kalendar for the old ſtyle, than they were at the time of the ſaid council; or ſix days lower for the new ſtyle, becauſe at preſent it differs 11 days from the old.

30
To find the golden number.

In the firſt of the following tables, the golden numbers under the months ſtand againſt the days of new moon in the left-hand column, for the new ſtyle; adapted chiefly to the ſecond year after leap-year, as being the neareſt mean for all the four; and will ſerve till the year 1900. Therefore, to find the day of new moon in any month of a given year till that time, look for the golden number of that year under the deſired month, and againſt it you have the day of new moon in the left hand column. Thus, ſuppoſe it were required to find the day of new moon in September 1789; the golden number for that year is 4, which I look for under September, and right againſt it, in the left-hand column, you will find 19, which is the day of new moon in that month. *N. B.* If all the golden numbers, except 17 and 6, were ſet one day lower in the table, it would ſerve from the beginning of the year 1900 till the end of the year 2199. The table at the end of this ſection ſhows the golden number for 4000 years after the birth of Chriſt, by looking for the even hundreds of any given year at the left hand, and for the reſt to make up that year at the head of the table; and where the columns meet, you have the golden number (which is the ſame both in old and new ſtyle) for the given year. Thus, ſuppoſe the golden number was wanted for the year 1789; look for 1700 at the left hand of the table, and for 89 at the top of it: then guiding your eye downward from 89 to overagainſt 1700, you will find 4, which is the golden number for that year.

But becauſe the lunar cycle of 19 years ſometimes includes five leap-years, and at other times only four, this table will ſometimes vary a day from the truth in leap-years after February. And it is impoſſible to have one more correct, unleſs we extend it to four times 19 or 76 years; in which there are 19 leap-years without a remainder. But even then to have it of perpetual uſe, it muſt be adapted to the old ſtyle; becauſe, in every centennial year not diviſible by 4, the regular courſe of leap-years is interrupted in the new; as was the caſe in the year 1800.

31 Dionyſian period, or cycle of Eaſter.

2. The *cycle of Eaſter*, alſo called the *Dionyſian period*, is a revolution of 532 years, found by multiplying the ſolar cycle 28 by the lunar cycle 19. If the new moons did not anticipate upon this cycle, Eaſter-day would always be the Sunday next after the firſt full moon which follows the 21ſt of March. But, on account of the above anticipation, to which no proper regard was had before the late alteration of the ſtyle, the eccleſiaſtic Eaſter has ſeveral times been a week different from the true Eaſter within this laſt century: which inconvenience is now remedied by making the table, which uſed to find Eaſter for ever, in the Common Prayer Book, of no longer uſe than the lunar difference from the new ſtyle will admit of.

The earlieſt Eaſter poſſible is the 22d of March, the lateſt the 25th of April. Within theſe limits are 35 days, and the number belonging to each of them is called the *number of direction*; becauſe thereby the time of Eaſter is found for any given year.

32 Dominical letter.

The firſt ſeven letters of the alphabet are commonly placed in the annual almanacks, to ſhow on what days of the week the days of the months fall throughout the year. And becauſe one of thoſe ſeven letters muſt neceſſarily ſtand againſt Sunday, it is printed in a capital form, and called the *dominical letter*; the other ſix being inſerted in ſmall characters, to denote the other ſix days of the week. Now, ſince a common Julian year contains 365 days, if this number be divided by 7 (the number of days in a week) there will remain one day. If there had been no remainder, it is plain the year would conſtantly begin on the ſame day of the week; but ſince one remains, it is plain that the year muſt begin and end on the ſame day of the week; and therefore the next year will begin on the day following. Hence, when January begins on Sunday, A is the dominical or Sunday letter for that year: Then, becauſe the next year begins on Monday, the Sunday will fall on the ſeventh day, to which is annexed the ſeventh letter G, which therefore will be the dominical letter for all that year: and as the third year will begin on Tueſday, the Sunday will fall on the ſixth day; therefore F will be the Sunday letter for that year. Whence it is evident, that the Sunday letters will go annually in a retrograde order thus, G, F, E, D, C, B, A. And, in the courſe of ſeven years, if they were all common ones, the ſame days of the week and dominical letters would return to the ſame days of the months. But becauſe there are 366 days in a leap-year, if this number be divided by 7, there will remain two days over and above the 52 weeks of which the year conſiſts. And therefore, if the leap-year begins on Sunday, it will end on Monday; and the next year will begin on Tueſday, the firſt Sunday whereof muſt fall on the ſixth of January, to which is annexed the letter F, and not G, as in common years. By this means, the leap-year returning every fourth year, the order of the dominical letters is interrupted; and the ſeries cannot return to its firſt ſtate till after four times ſeven, or 28 years; and then the ſame days of the months return in order to the ſame days of the week as before.

TABLE I.

Days.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	9		9	17	17	6				11		19
2		17			6	14	14	3	11		19	
3	17	6	17	6			3	11		19	8	8
4	6		6	14	14	3			19	8		16
5		14			3	11	11	19	8		16	
6	14	3	14	3			19			16	5	5
7	3		3	11	11	19		8	16			13
8		11			19	8	8	16	5	5	13	
9	11	19	11	19						13		2
10			19	8	8	16	16	5	13		2	10
11	19	8					5	13	2	2	10	
12	8	16	8	16	16	5				10		18
13					5	13	13	2	10		18	7
14	16	5	16	5			2	10	18	18	7	
15	5			13	13	2				7		15
16		13			2	10	10	18	7		15	
17	13	2	13	2			18	7		15	4	4
18	2		2	10	10	18			15			12
19		10			18	7	7	15	4	4	12	
20	10	18	10	18			15			12	1	1
21	18		18	7	7	15		4	12			9
22		7			15	4	4	12	1	1	9	
23	7	15	7	15			12			9	17	17
24			15	4	4	12		1	9			6
25	15	4			12		1	9	17	17	6	
26	4		4	12		1				6		15
27		12		1	1	9	9	17	6		14	
28	12	1	12		9		17	6	14	14	3	3
29	1		1	9		17				3		11
30					17	6	6	14	3		11	
31	9		9				14	3		11		19

TABLE II.

TABLE, *ſhowing the Golden Number, (which is the ſame both in the Old and New Style) from the Chriſtian Era, to A. D.* 4000.

Hundreds of Years.			Years leſs than a hundred.																		
			0 19 38 57 76 95	1 20 39 58 77 96	2 21 40 59 78 97	3 22 41 60 79 98	4 23 42 61 80 99	5 24 43 62 81	6 25 44 63 82	7 26 45 64 83	8 27 46 65 84	9 28 47 66 85	10 29 48 67 86	11 30 49 68 87	12 31 50 69 88	13 32 51 70 89	14 33 52 71 90	15 34 53 72 91	16 35 54 73 92	17 36 55 74 93	18 37 56 75 94
0	1900	3800	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
100	2000	3900	6	7	8	9	10	11	12	13	14	15	16	17	18	19	1	2	3	4	5
200	2100	4000	11	12	13	14	15	16	17	18	19	1	2	3	4	5	6	7	8	9	10
300	2200	&c.	16	17	18	19	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
400	2300	—	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	1
500	2400	—	7	8	9	10	11	12	13	14	15	16	17	18	19	1	2	3	4	5	6
600	2500	—	12	13	14	15	16	17	18	19	1	2	3	4	5	6	7	8	9	10	11
700	2600	—	17	18	19	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
800	2700	—	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	1	2
900	2800	—	8	9	10	11	12	13	14	15	16	17	18	19	1	2	3	4	5	6	7
1000	2900	—	13	14	15	16	17	18	19	1	2	3	4	5	6	7	8	9	10	11	12
1100	3000	—	18	19	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1200	3100	—	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	1		3
1300	3200	—	9	10	11	12	13	14	15	16	17	18	19	1	2	3	4	5	6	7	8
1400	3300	—	14	15	16	17	18	19	1	2	3	4	5	6	7	8	9	10	11	12	13
1500	3400	—	19	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1600	3500	—	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	1	2	3	4
1700	3600	—	10	11	12	13	14	15	16	17	18	19	1	2	3	4	5	6	7	8	9
1800	3700	—	15	16	17	18	19	1	2	3	4	5	6	7	8	9	10	11	12	13	14

33 Julian period.

From the multiplication of the ſolar cycle of 28 years into the lunar cycle of 19 years, and the Roman indiction of 15 years, ariſes the great Julian period, conſiſting of 7980 years, which had its beginning 764 years before Strauchius's ſuppoſed year of the creation (for no later could all the three cycles begin together), and it is not yet completed: And therefore it includes all other cycles, periods, and eras. There is but one year in the whole period that has the ſame numbers for the three cycles of which it is made up: And therefore, if hiſtorians had remarked in their writings the cycles of each year, there had been no diſpute about the time of any action recorded by them.

34 To find the year of the Julian period.

The Dionyſian or vulgar era of Chriſt's birth was about the end of the year of the Julian period 4713; and conſequently the firſt year of his age, according to that account, was the 4714th year of the ſaid period. Therefore, if to the current year of Chriſt we add 4713, the ſum will be the year of the Julian period. So the year 1789 will be found to be the 6502d year of that period. Or, to find the year of the Julian period anſwering to any given year before the firſt year of Chriſt, ſubtract the number of that given year from 4714, and the remainder will be the year of the Julian period. Thus, the year 585 before the firſt year of Chriſt (which was the 584th before his birth) was the 4129th year of the ſaid period. Laſtly, to find the cycles of the ſun, moon, and indiction for any given year of this period, divide the given year by 28, 19, and 15; the three remainders will be the cycles ſought, and the quotients the number of cycles run ſince the beginning of the period. So in the above 4714th year of the Julian period, the cycle of the ſun was 10, the cycle of the moon 2, and the cycle of indiction 4; the ſolar cycle having run through 168 courſes, the lunar 248, and the indiction 314.

35 Year of Chriſt's birth when ſettled.

The vulgar era of Chriſt's birth was never ſettled till the year 527, when Dionyſius Exiguus, a Roman abbot, fixed it to the end of the 4713th year of the Julian period, which was four years too late; for our Saviour was born before the death of Herod, who ſought to kill him as ſoon as he heard of his birth. And according to the teſtimony of Joſephus (*B.* xvii. *ch.* 8.), there was an eclipſe of the moon in the time of Herod's laſt illneſs; which eclipſe appears by our aſtronomical tables to have been in the year of the Julian period 4710, March 13. at three hours paſt midnight, at Jeruſalem. Now, as our Saviour muſt have been born ſome months before Herod's death, ſince in the interval he was carried into Egypt, the lateſt time in which we can fix the true era of his birth is about the end of the 4709th year of the Julian period.

36
Eras or Epochs.

As there are certain fixed points in the heavens from which aſtronomers begin their computations, ſo there are certain points of time from which hiſtorians begin to reckon ; and theſe points or roots of time are called *eras* or *epochs*. The moſt remarkable eras are, thoſe of the Creation, the Greek Olympiads, the building of Rome, the era of Nabonaſſar, the death of Alexander. the birth of Chriſt, the Arabian Hegira, and the Perſian Jeſdegird : All which, together with ſeveral others of leſs note, have their beginnings fixed by chronologers to the years of the Julian period, to the age of the world at thoſe times, and to the years before and after the year of Chriſt's birth.

37
Hiſtoric chronology.

HAVING thus treated as fully as our limits will admit, of the various diviſions of time, we muſt now conſider the ſecond part of chronology, viz. that which more immediately relates to hiſtory, and which has already been obſerved to have the four following foundations : 1. Aſtronomical obſervations, particularly of eclipſes. 2. The teſtimonies of credible authors. 3. Epochs in hiſtory univerſally allowed to be true. 4. Ancient medals, coins, monuments, and inſcriptions. We ſhall conſider theſe four principal parts in the order they here ſtand.

38
Of eclipſes of the ſun and moon.

I. It is with great reaſon that the eclipſes of the ſun and moon, and the aſpects of the other planets, have been called public and celeſtial characters of the times, as their calculations afford chronologers infallible proofs of the preciſe epochs in which a great number of the moſt ſignal events in hiſtory have occurred. So that in chronological matters we cannot make any great progreſs, if we are ignorant of the uſe of aſtronomic tables, and the calculation of eclipſes. The ancients regarded the latter as prognoſtics of the fall of empires, of the loſs of battles, of the death of monarchs, &c. And it is to this ſuperſtition, to this wretched ignorance, that we happily owe the vaſt labour that hiſtorians have taken to record ſo great a number of them. The moſt able chronologers have collected them with ſtill greater labour. Calviſius, for example, founds his chronology on 144 eclipſes of the ſun, and 127 of the moon, that he ſays he had calculated. The grand conjunction of the two ſuperior planets, Saturn and Jupiter, which, according to Kepler, occurs once in 800 years in the ſame point of the zodiac, and which has happened only eight times ſince the creation (the laſt time in the month of December 1603), may alſo furniſh chronology with inconteſtible proofs. The ſame may be ſaid of the tranſit of Venus over the ſun, which has been obſerved in our days, and all the other uncommon poſitions of the planets. But among theſe celeſtial and natural characters of times, there are alſo ſome that are named *civil* or *artificial*, and which, nevertheleſs, depend on aſtronomic calculation.

Such are the ſolar and lunar cycles ; the Roman indiction ; the feaſt of Eaſter ; the biſſextile year ; the jubilees ; the ſabbatic years ; the combats and Olympic games of the Greeks, and Hegira of the Mahometans, &c. And to theſe may be added the periods, eras, epochs, and years of different nations, ancient and modern. We ſhall only remark on this occaſion, that the period or era of the Jews commences with the creation of the world ; that of the ancient Romans with the foundation of the city of Rome ; that of the Greeks at the eſtabliſhment of the Olympic games ; that of Nabonaſſar, with the advancement of the firſt king of Babylon to the throne ; the Yezdegerdic years, with the laſt king of the Perſians of that name ; the Hegira of the Turks, with the flight of Mahomet from Mecca to Medina, &c. The year of the birth of Chriſt was the 4713th year of the Julian period, according to the common method of reckoning. Aſtronomical chronology teaches us to calculate the preciſe year of the Julian period in which each of theſe epochs happened.

39
Of the teſtimony of authors.

II. The teſtimony of authors is the ſecond principal part of hiſtoric chronology. Though no man whatever has a right to pretend to infallibility, or to be regarded as a ſacred oracle, it would, however, be making a very unjuſt judgment of mankind, to treat them all as dupes or impoſtors ; and it would be an injury offered to public integrity, were we to doubt the veracity of authors univerſally eſteemed, and of facts that are in themſelves highly worthy of belief. It would be even a kind of infatuation to doubt that there have been ſuch cities as Athens, Sparta, Rome, Carthage, &c. or that Xerxes reigned in Perſia, and Auguſtus in Rome : whether Hannibal ever was in Italy ; or that the emperor Conſtantine built Conſtantinople, &c. The unanimous teſtimony of the moſt reſpectable hiſtorians will not admit any doubt of theſe matters. When an hiſtorian is allowed to be completely able to judge of an event, and to have no intent of deceiving by his relation, his teſtimony is unexceptionable. But to avoid the danger of adopting error for truth, and to be ſatisfied of a fact that appears doubtful in hiſtory, we may make uſe of the four following rules, as they are founded in reaſon.

1. We ought to pay a particular regard to the teſtimonies of thoſe who wrote at the ſame time the events happened, and who have not been contradicted by any cotemporary author of known authority. Who can doubt, for example, of the truth of the facts related by Admiral Anſon, in the hiſtory of his voyage round the world ? The admiral ſaw all the facts there mentioned with his own eyes, and publiſhed his book when two hundred companions of his voyage were ſtill living in London, and could have contradicted him immediately, if he had given any falſe or exaggerated relations.

2. After the cotemporary authors, we ſhould give more credit to thoſe who lived near the time the events happened than thoſe who lived at a diſtance.

3. Thoſe doubtful hiſtories, which are related by authors that are but little known, can have no weight, if they are at variance with reaſon, or eſtabliſhed tradition.

4. We muſt diſtruſt the truth of a hiſtory that is related by modern authors, when they do not agree among themſelves in ſeveral circumſtances, nor with ancient hiſtorians, who are to be regarded as original ſources. We ſhould eſpecially doubt the truth of thoſe brilliant portraits, that are drawn at pleaſure by ſuch as never knew the perſons they are intended for, and even made ſeveral centuries after their deceaſe.

The moſt pure and moſt fruitful ſource of ancient hiſtory is doubtleſs to be found in the Holy Bible. Let us here for a moment ceaſe to regard it as divine, and let us preſume to conſider it as a common hiſtory. Now, when we regard the writers of the books of the Old Teſtament, and conſider them ſometimes as authors, ſometimes as ocular witneſſes, and ſometimes as reſpectable hiſtorians; whether we reflect on the ſimplicity of the narration, and the air of truth that is there conſtantly viſible; or, when we conſider the care that the people, the governments, and the learned men of all ages, have taken to preſerve the true text of the Bible; or that we have regard to the happy conformity of the chronology of the holy ſcriptures with that of profane hiſtory; or, if we obſerve the admirable harmony that is between theſe books and the moſt reſpectable hiſtorians, as Joſephus and others: and laſtly, when we conſider that the books of the holy ſcripture furniſh us alone with an accurate hiſtory of the world from the creation, through the line of patriarchs, judges, kings, and princes of the Hebrews; and that we may, by its aid, form an almoſt entire ſeries of events down to the birth of Chriſt, or the time of Auguſtus, which comprehends a ſpace of about 4000 years, ſome ſmall interruptions excepted, and which are eaſily ſupplied by profane hiſtory; when all theſe reflections are juſtly made, we muſt conſtantly allow that the ſcriptures form a book which merits the firſt rank among all the ſources of ancient hiſtory. It has been objected, that this book contains contradictions; but the moſt able interpreters have reconciled theſe ſeeming contradictions. It has been ſaid, that the chronology of the Hebrew text and the Vulgate do not agree with the chronology of the verſion of the Septuagint; but the ſoundeſt critics have ſhown that they may be made to agree. It has been obſerved, moreover, that the Scriptures abound with miracles and prodigies; but they are miracles that have really happened: and what ancient hiſtory is there that is not filled with miracles and other marvellous events? And do we for that reject their authority? Cannot the true God be ſuppoſed to have performed thoſe miracles which Pagan hiſtorians have attributed to their falſe divinities? Muſt we pay no regard to the writings of Livy, becauſe his hiſtory contains may fabulous relations?

40 Epochs.

III. The *epochs* form the third principal part of chronology. Theſe are thoſe fixed points in hiſtory that have never been conteſted, and of which there can, in fact, be no doubt. Chronologers fix on the events that are to ſerve as epochs, in a manner quite arbitrary; but this is of little conſequence, provided the dates of theſe epochs agree, and that there is no contradiction in the facts themſelves. When we come to treat expreſsly on hiſtory, we ſhall mention, in our progreſs, all the principal epochs.

41 Medals, &c.

IV. Medals, monuments, and inſcriptions, form the fourth and laſt principal part of chronology. It is ſcarce more than 150 years ſince cloſe application has been made to the ſtudy of theſe; and we owe to the celebrated Spanheim the greateſt obligations, for the progreſs that is made in this method: his excellent work, *De præſtantia et uſu numiſmatum antiquorum*, has ſhown the great advantages of it; and it is evident that theſe monuments are the moſt authentic witneſſes that can be produced. It is by the aid of medals that M. Vaillant has compoſed his judicious hiſtory of the kings of Syria, from the time of Alexander the Great to that of Pompey: they have been, moreover, of the greateſt ſervice in elucidating all ancient hiſtory, eſpecially that of the Romans; and even ſometimes that of the middle age. Their uſe is more fully ſpoken of in the article MEDALS. What we here ſay of medals, is to be underſtood equally, in its full force, of ancient inſcriptions, and of all other authentic monuments that have come down to us.

Every reader, endowed with a juſt diſcernment, will readily allow that theſe four parts of chronology afford clear lights, and are excellent guides to conduct us through the thick darkneſs of antiquity. That impartiality, however, which directs us to give a faithful relation of that which is true and falſe, of the certainty and uncertainty of all the ſciences, obliges us here freely to confeſs, that theſe guides are not infallible, nor the proofs that they afford mathematical demonſtrations. In fact, with regard to hiſtory in general, and ancient hiſtory in particular, ſomething muſt be always left to conjecture and hiſtoric faith. It would be an offence againſt common probity were we to ſuffer ourſelves to paſs over in ſilence thoſe objections which authors of the greateſt reputation have made againſt the certainty of chronology. We ſhall extract them from their own works; and we hope that there is no magiſtrate, theologian, or public profeſſor in Europe, who would be mean enough to accuſe us of a crime, for not unworthily diſguiſing the truth.

1. The prodigious difference there is between the Septuagint Bible and the Vulgate, in point of chronology, occaſions an embarraſſment, which is the more difficult to avoid, as we cannot poſitively ſay on which ſide the error lies. The Greek Bible counts, for example, from the creation of the world to the birth of Abraham, 1500 years more than the Hebrew or Latin Bibles, &c. 2. How difficult is it to aſcertain the years of the Judges of the Jewiſh nation, in the Bible? What darkneſs is ſpread over the ſucceſſion of the kings of Judah and Iſrael? The calculation of time is there ſo inaccurate, that the Scripture never marks if they are current or complete years. For we cannot ſuppoſe that a patriarch, judge, or king, lived exactly 60, 90, 100, or 969 years, without any odd months or days. 3. The different names that the Aſſyrians, Egyptians, Perſians, and Greeks, have given to the ſame prince, have contributed not a little to embarraſs all ancient chronology. Three or four princes have borne the name of Aſſuerus, though they had alſo other names. If we did not know that Nabucodonoſor, Nabucodroſor, and Nabucolaſſar, were the ſame name, or the name of the ſame man, we ſhould ſcarcely believe it Sargon is Sennacherib; Ozias is Azarias; Sedecias is Mathanias; Joachas is alſo called Sellum; Aſaraddon, which is pronounced indifferently Eſarhaddon and Aſarhaddon, is called Aſenaphar by the Cuthæans; and by an oddity of which we do not know the origin, Sardanapalus is called by the Greeks Tenos Concoleros 4. There remain to us but few monuments of the firſt monarchs of

the world. Numberleſs books have been loſt, and thoſe which have come down to us are mutilated or altered by tranſcribers. The Greeks began to write very late. Herodotus, their firſt hiſtorian, was of a credulous diſpoſition, and believed all the fables that were related by the Egyptian prieſts. The Greeks were in general vain, partial, and held no nation in eſteem but their own. The Romans were ſtill more infatuated with notions of their own merit and grandeur: their hiſtorians were altogether as unjuſt as was their ſenate, toward other nations that were frequently far more reſpectable. 5. The eras, the years, the periods, and epochs, were not the ſame in each nation; and they, moreover, began at different ſeaſons of the year. All this has thrown ſo much obſcurity over chronology, that it appears to be beyond all human capacity totally to diſperſe it.

Chriſtianity itſelf had ſubſiſted near 1200 years, before they knew preciſely how many years had paſſed ſince the birth of our Saviour. They ſaw clearly that the vulgar era was defective, but it was a long time before they could comprehend that it required four whole years to make up the true period. Abbé Denis the Little, who in the year 532 was the firſt among the Chriſtians to form the era of that grand epoch, and to count the years from that time, in order to make their chronology altogether Chriſtian, erred in his calculation, and led all Europe into his error. They count 132 contrary opinions of different authors concerning the year in which the Meſſiah appeared on the earth. M. Vallemont names 64 of them, and all celebrated writers. Among all theſe authors, however, there is none that reckon more than 7000, nor leſs than 3700 years. But even this difference is enormous. The moſt moderate fix the birth of Chriſt in the 4000th year of the world. The reaſons, however, on which they found their opinion, appear to be ſufficiently arbitrary.

Be theſe matters, however, as they may, the wiſdom of Providence has ſo diſpoſed all things, that there remain ſufficient lights to enable us nearly to connect the ſeries of events: for in the firſt 3000 years of the world, where profane hiſtory is defective, we have the chronology of the Bible to direct us; and after that period, where we find more obſcurity in the chronology of the Holy Scriptures, we have, on the other hand, greater lights from profane authors. It is at this period that begins the time which Varro calls *hiſtoric*; as, ſince the time of the Olympiads, the truth of ſuch events as have happened ſhines clear in hiſtory. Chronology, therefore, draws its principal lights from hiſtory; and, in return, ſerves it as a guide. Referring the reader, therefore, to the article History, and the *Chart* thereto annexed, we ſhall conclude the preſent article with

A Chronological Table *of Remarkable Events, Diſcoveries, and Inventions, from the Creation to the year* 1804.

Bef. Chriſt.

4008 The Creation of the world and Adam and Eve.

4007 The birth of Cain, the firſt who was born of a woman.

3017 Enoch, for his piety, is tranſlated to heaven.

2352 The old world is deſtroyed by a deluge which continued 377 days.

2247 The tower of Babel is built about this time by Noah's poſterity, upon which God miraculouſly confounds their language, and thus diſperſes them into different nations.

2237 About this time, Noah is, with great probability, ſuppoſed to have parted from his rebellious offspring, and to have led a colony of ſome of the more tractable into the eaſt, and there either he or one of his ſucceſſors to have founded the ancient Chineſe monarchy.

2234 The celeſtial obſervations are begun at Babylon, the city which firſt gave birth to learning and the ſciences.

2188 Miſraim, the ſon of Ham, founds the kingdom of Egypt, which laſted 1663 years, down to the conqueſt of Cambyſes, in 525 before Chriſt.

2059 Ninus, the ſon of Belus, founds the kingdom of Aſſyria, which laſted above 1000 years, and out of its ruins were formed the Aſſyrians of Babylon, thoſe of Nineveh, and the kingdom of the Medes.

1985 The covenant of God made with Abram, when he leaves Haran, to go into Canaan, which begins the 430 years of ſojourning.

1961 The cities of Sodom and Gomorra are deſtroyed for their wickedneſs by fire from heaven.

1856 The kingdom of Argos, in Greece, begins under Inachus.

1822 Memnon, the Egyptian, invents the letters.

1715 Prometheus firſt ſtruck fire from flints.

1635 Joſeph dies in Egypt.

1574 Aaron born in Egypt; 1490, appointed by God firſt high-prieſt of the Iſraelites.

1571 Moſes, brother to Aaron, born in Egypt, and adopted by Pharaoh's daughter, who educates him in all the learning of the Egyptians.

1556 Cecrops brings a colony of Saites from Egypt into Attica, and begins the kingdom of Athens in Greece.

1555 Moſes performs a number of miracles in Egypt, and departs from that kingdom, together with 600,000 Iſraelites, beſides children, which completed the 430 years of ſojourning. They miraculouſly paſs through the Red Sea, and come to the deſert of Sinai, where Moſes receives from God, and delivers to the people, the Ten Commandments, and the other laws, and ſets up the tabernacle, and in it the ark of the covenant.

1546 Scamander comes from Crete into Phrygia, and begins the kingdom of Troy.

1515 The Iſraelites, after ſojourning in the Wilderneſs forty years, are led under Joſhua into the land of Canaan, where they fix themſelves, after having ſubdued the natives; and the period of the ſabbatical year commences.

1503 The deluge of Deucalion.

1496 The council of Amphictyons eſtabliſhed at Thermopylæ.

1493 Cadmus carried the Phenician letters into Greece, and built the citadel of Thebes.

1490 Sparta built by Lacedæmon.

1485 The firſt ſhip that appeared in Greece was brought from Egypt by Danaus, who arrived at Rhodes, and brought with him his fifty daughters.
1480 Troy built by Dardanus.
1452 The Pentateuch, or five firſt books of Moſes, are written in the land of Moab, where he died the year following, aged 110.
1406 Iron is found in Greece, from the accidental burning of the woods.
1344 The kingdom of Mycenæ begins.
1325 Iſthmian games inſtituted at Corinth.
1325 The Egyptian canicular year began July 20th.
1307 The Olympic games inſtituted by Pelops.
1300 The Lupercalia inſtituted.
1294 The firſt colony came from Italy to Sicily.
1264 The ſecond colony came from Italy to Sicily.
1252 The city of Tyre built.
1243 A colony of Arcadians conducted by Evander into Italy.
1233 Carthage founded by the Tyrians
1225 The Argonautic expedition.
1204 The rape of Helen by Paris, which gave riſe to the Trojan war, ending with the deſtruction of the city in 1184.
1176 Salamis in Cyprus built by Teucer.
1152 Aſcanius builds Alba Longa.
1130 The kingdom of Sicyon ended.
1124 Thebes built by the Bœotians.
1115 The mariner's compaſs known in China.
1104 The expedition of the Heraclidæ into Peloponneſus; the migration of the Dorians thither; and the end of the kingdom of Mycenæ.
1102 The kingdom of Sparta commenced.
1070 The kingdom of Athens ended.
1051 David beſieged and took Jeruſalem.
1044 Migration of the Ionian colonies.
1008 The Temple is ſolemnly dedicated by Solomon.
996 Solomon prepared a fleet on the Red Sea to ſend to Ophir.
986 Samos and Utica in Africa built.
979 The kingdom of Iſrael divided.
974 Jeruſalem taken and plundered by Shiſhak king of Egypt.
911 The prophet Elijah flouriſhed.
894 Money firſt made of gold and ſilver at Argos.
884 Olympic games reſtored by Iphitus and Lycurgus.
873 The art of ſculpture in marble found out.
869 Scales and meaſures invented by Phidon.
864 The city of Carthage, in Africa, enlarged by Queen Dido.
821 Nineveh taken by Arbaces.
814 The kingdom of Macedon begins.
801 The city of Capua in Campania built.
799 The kingdom of Lydia began.
786 The ſhips called *Triremes* invented by the Corinthians.
779 The race of kings in Corinth ended.
776 The era of the Olympiads began.
760 The Ephori eſtabliſhed at Sparta.
758 Syracuſe built by Archias of Corinth.
754 The government of Athens changed.
753 Era of the building of Rome in Italy by Romulus, firſt king of the Romans.
747 The era of Nabonaſſer commenced on the 26th of February; the firſt day of Thoth.
746 The government of Corinth changed into a republic.
743 The firſt war between the Meſſenians and Spartans.
742 Mycenæ reduced by the Spartans.
724 A colony of the Meſſenians ſettled at Rhegium in Italy.
720 Samaria taken, after three years ſiege, and the kingdom of Iſrael finiſhed by Salmanazer king of Aſſyria, who carries the ten tribes into captivity.
The firſt eclipſe of the moon on record.
713 Gela in Sicily built.
703 Corcyra, now Corfu, founded by the Corinthians.
702 Ecbatan in Media built by Deioces.
685 The ſecond Meſſenian war under Ariſtomenes.
670 Byzantium (now Conſtantinople) built by a colony of Athenians.
666 The city of Alba deſtroyed.
648 Cyrene in Africa founded.
634 Cyaxares beſieges Nineveh, but is obliged to raiſe the ſiege by an incurſion of the Scythians, who remained maſters of Aſia for 28 years.
624 Draco publiſhed his inhuman laws at Athens.
610 Pharaoh Necho attempted to make a canal from the Nile to the Red Sea, but was not able to accompliſh it.
607 By order of the ſame monarch, ſome Phenicians ſailed from the Red Sea round Africa, and returned by the Mediterranean.
606 The firſt captivity of the Jews by Nebuchadnezzar. Nineveh deſtroyed by Cyaxares.
600 Thales, of Miletus, travels into Egypt, conſults the prieſts of Memphis, acquires the knowledge of geometry, aſtronomy, and philoſophy; returns to Greece, calculates eclipſes, gives general notions of the univerſe, and maintains that an only Supreme Intelligence regulates all its motions.
Maps, globes, and the ſigns of the zodiac, invented by Anaximander, the ſcholar of Thales.
598 Jehoiakin, king of Juda, is carried away captive, by Nebuchadnezzar, to Babylon.
594 Solon made Archon at Athens.
591 The Pythian games inſtituted in Greece, and tragedy firſt acted.
588 The firſt irruption of the Gauls into Italy.
586 The city of Jeruſalem taken after a ſiege of 18 months.
582 The laſt captivity of the Jews by Nebuchadnezzar.
581 The Iſthmian games reſtored.
580 Money firſt coined at Rome.
571 Tyre taken by Nebuchadnezzar after a ſiege of 13 years.
566 The firſt cenſus at Rome, when the number of citizens was found to be 84,000.
562 The firſt comedy at Athens acted upon a moveable ſcaffold.
559 Cyrus the firſt king of Perſia.
538 The kingdom of Babylon finiſhed; that city being

ing taken by Cyrus, who, in 536, gives an edict for the return of the Jews.

534 The foundation of the temple laid by the Jews.

526 Learning is greatly encouraged at Athens, and a public library firſt founded.

520 The ſecond edict to rebuild Jeruſalem.

515 The ſecond temple at Jeruſalem is finiſhed under Darius.

510 Hippias baniſhed from Athens.

509 Tarquin, the ſeventh and laſt king of the Romans, is expelled, and Rome is governed by two conſuls, and other republican magiſtrates, till the battle of Pharſalia, being a ſpace of 461 years.

508 The firſt alliance between the Romans and Carthaginians.

507 The ſecond cenſus at Rome, 130,000 citizens.

504 Sardis taken and burnt by the Athenians, which gave occaſion to the Perſian invaſion of Greece.

498 The firſt dictator appointed at Rome.

497 The Saturnalia inſtituted at Rome.

The number of citizens 150,700.

493 Tribunes created at Rome; or, in 488.

490 The battle of Marathon, September 28.

486 Æſchylus, the Greek poet, firſt gains the prize of tragedy.

483 Queſtors created at Rome.

481 Xerxes, king of Perſia, begins his expedition againſt Greece.

480 The defence of Thermopylæ by Leonidas, and the ſea-fight at Salamis.

476 The number of Roman citizens reduced to 103,000.

469 The third Meſſenian war.

466 The number of Roman citizens increaſed to 124,214.

458 Ezra is ſent from Babylon to Jeruſalem, with the captive Jews and the veſſels of gold and ſilver, &c. being ſeventy weeks of years, or 490 years, before the crucifixion of our Saviour.

456 The Ludi Seculares firſt celebrated at Rome.

454 The Romans ſend to Athens for Solon's laws.

451 The Decemvirs created at Rome, and the laws of the twelve tables compiled and ratified.

449 The Decemvirs baniſhed.

445 Military tribunes, with conſular power, created at Rome.

443 Cenſors created at Rome.

441 The battering ram invented by Artemones.

437 The Metonic cycle began July 15th.

431 The Peloponneſian war began, and laſted 27 years.

430 The hiſtory of the Old Teſtament finiſhes about this time.

A plague over all the known world.

Malachi the laſt of the prophets.

405 The Athenians entirely defeated by Lyſander, which occaſions the loſs of the city, and ruin of the Athenian power.

401 The retreat of the 10,000 Greeks under Xenophon. The 30 tyrants expelled from Athens, and democratic government reſtored.

400 Socrates, the founder of moral philoſophy among the Greeks, believes the immortality of the ſoul, a ſtate of rewards and puniſhments; for which and other ſublime doctrines, he is put to death by the Athenians, who ſoon after repent, and erect to his memory a ſtatue of braſs.

399 The feaſt of Lectiſternium inſtituted. Catapultæ invented by Dionyſius.

394 The Corinthian war begun.

390 Rome burnt by the Gauls.

387 The peace of Antalcidas between the Greeks and Perſians.

The number of Roman citizens amounted to 152,583.

384 Dionyſius begins the Punic war.

379 The Bœotian war commences.

377 A general conſpiracy of the Greek ſtates againſt the Lacedemonians.

373 A great earthquake in Peloponneſus.

371 The Lacedemonians defeated by Epaminondas at Leuctra.

367 Prætors eſtabliſhed in Rome. The Licinian law paſſed.

363 Epaminondas killed at the battle of Mantinea.

359 The obliquity of the ecliptic obſerved to be 23° 49′ 10″.

358 The Social war began.

357 Dionyſius expelled from Syracuſe.

A tranſit of the moon over Mars obſerved.

356 The Sacred war begun in Greece.

Birth of Alexander the Great.

345 Dionyſius II. expelled from Syracuſe.

Commencement of the Syracuſan era.

338 Philip of Macedon gains the battle of Chæronæa, and thus attains to the ſovereignty of Greece.

335 Thebes taken and raſed by Alexander the Great.

334 The Perſians defeated at Granicus, May 22.

333 They are again defeated at Iſſus in Cilicia, October.

332 Alexander takes Tyre, and marches to Jeruſalem.

331 Alexandria built.

Darius entirely defeated at Arbela.

330 Alexander takes Babylon, and the principal cities of the Perſian empire.

The Calippic period commences.

328 Alexander paſſes Mount Caucaſus, and marches into India.

327 He defeats Porus, an Indian prince, and founds ſeveral cities.

326 The famous ſedition of Corcyra.

324 His family exterminated, and his dominions parted by his officers.

323 Alexander the Great dies at Babylon.

315 Rhodes almoſt deſtroyed by an inundation.

311 The Appian way, aqueducts, &c. conſtructed at Rome.

308 The cities of Greece recovered their liberties for a ſhort time.

307 Antioch, Seleucia, Laodicea, and other cities, founded by Seleucus.

301 Antigonus defeated and killed at Ipſus.

299 The firſt barbers came from Sicily to Rome.

294 The number of effective men in Rome amounts to 270,000.

293 The firſt ſun-dial erected at Rome by Papirius Curſor.

285 Dionyſius of Alexandria began his aſtronomical era on Monday June 26. being the firſt who found the exact ſolar year to conſiſt of 365 days, 5 hours and 49 minutes.
The watch tower of Pharos at Alexandria built.
Ptolemy Philadelphus, king of Egypt, employs 72 interpreters to tranſlate the Old Teſtament into the Greek language, which is called the *Septuagint*.
284 The foundations of the Achæan republic laid.
283 The college and library founded at Alexandria.
282 The Tarentine war begins.
280 Pyrrhus invades Italy.
279 A cenſus at Rome. The number of citizens 278,222.
269 The firſt coining of ſilver at Rome.
265 The number of Roman citizens augmented to 292,224.
264 The firſt Punic war begins, and continues 23 years. The chronology of the Arundelian marbles compoſed.
262 A tranſit of Mercury over the bull's horn; the planet being in 23° of ♉, and the ſun in 29° 30′ ♈.
260 Provincial queſtors eſtabliſhed at Rome.
The Romans firſt concern themſelves in naval affairs, and defeat the Carthaginians at ſea.
255 Regulus, the Roman conſul, defeated and taken priſoner by the Carthaginians under Xantippus.
252 A cenſus at Rome. The number of citizens 297,897.
247 Another cenſus. The number of citizens 251,212.
246 The records of China deſtroyed.
241 Concluſion of the firſt Punic war.
240 Comedies firſt acted at Rome.
237 Hamilcar, the Carthaginian, cauſes his ſon Hannibal, at nine years old, to ſwear eternal enmity to the Romans.
236 The Tartars expelled from China.
235 Rome at peace with other nations. The temple of Janus ſhut.
231 Corſica and Sardinia ſubdued by the Romans.
The firſt divorce at Rome.
230 The obliquity of the ecliptic obſerved by Eratoſthenes to be 23° 51′ 20″.
224 The Coloſſus at Rhodes overturned by an earthquake.
219 The art of ſurgery introduced at Rome.
218 Commencement of the ſecond Punic war.
Hannibal paſſes the Alps, and invades Italy.
216 The Romans defeated at Cannæ, May 21ſt.
214 Syracuſe beſieged by Marcellus.
209 A cenſus at Rome. The number of citizens 227,107.
208 Aſdrubal invades Italy; but is defeated and killed.
206 Gold firſt coined at Rome.
202 Hannibal defeated by Scipio at Zama.
201 Concluſion of the ſecond Punic war.
194 Sparta and Hither Spain ſubdued by the Romans.
192 A cenſus at Rome. The number of citizens 243,704.
191 Antiochus defeated by the Romans at Thermopylæ.
190 The firſt Roman army enters Aſia, and from the ſpoils of Antiochus brings the Aſiatic luxury firſt to Rome.
188 The Spartans obliged to renounce the inſtitutions of Lycurgus.
179 A cenſus at Rome. The number of citizens 273,244.
173 The Jewiſh high-prieſthood ſold by Antiochus Epiphanes.
170 Paper invented in China.
The temple of Jeruſalem plundered by Antiochus.
169 A cenſus at Rome. The number of citizens 212,805.
168 Macedon reduced to the form of a Roman province.
The firſt library erected at Rome.
165 The temple of Jeruſalem purified by Judas Maccabeus.
164 A cenſus at Rome. The number of citizens 327,032.
162 Hipparchus began his aſtronomical obſervations at Rhodes.
161 Philoſophers and rhetoricians baniſhed from Rome.
150 The third Punic war commenced.
146 Corinth deſtroyed.
Carthage, the rival to Rome, is raſed to the ground by the Romans.
A remarkable comet appeared in Greece.
143 Hipparchus began his new cycle of the moon, conſiſting of 111,035 days.
141 The Numantine war commenced.
135 The hiſtory of the Apocrypha ends.
133 Numantia deſtroyed by Scipio.
124 A cenſus at Rome. The number of citizens 390,736.
105 The Cimbri and Teutones defeated the Romans.
102 The Teutones and Ambrones defeated by Marius.
88 Rome beſieged by the chiefs of the Marian faction.
82 Sylla created perpetual dictator at Rome.
69 A cenſus at Rome. The number of citizens 450,000.
66 Catiline's conſpiracy.
55 Julius Cæſar makes his firſt expedition into Britain.
Craſſus defeated and killed by the Parthians.
51 Gaul reduced to a Roman province.
50 A cenſus at Rome. The number of citizens 320,000.
48 The battle of Pharſalia, between Cæſar and Pompey, in which the latter is defeated.
The Alexandrian library, conſiſting of 400,000 valuable books, burnt by accident.
45 The war of Africa, in which Cato kills himſelf.
The ſolar year introduced by Cæſar.
44 Cæſar, the greateſt of the Roman conquerors, after having fought 50 pitched battles, and ſlain 1,192,000 men, is killed in the ſenate-houſe by conſpirators.
42 The republicans defeated at Philippi.
31 The battle of Actium fought, in which Mark

Before Chriſt.

Antony and Cleopatra are totally defeated by Octavius, nephew to Julius Cæſar.
30 Alexandria, in Egypt, is taken by Octavius, upon which Antony and Cleopatra put themſelves to death, and Egypt is reduced to a Roman province.
29 A cenſus at Rome. The number of citizens 4,101,017.
27 Octavius, by a decree of the ſenate, obtains the title of Auguſtus Cæſar, and an abſolute exemption from the laws, and is properly the firſt Roman emperor.
The pantheon at Rome built.
19 Rome at the height of its glory.
The temple of Jeruſalem rebuilt by Herod.
Agrippa conſtructed the magnificent aqueducts at Rome.
8 A cenſus at Rome. The number of citizens 4,233,000.
5 The temple of Janus is ſhut by Auguſtus, as an emblem of univerſal peace; and
JESUS CHRIST is born, on Monday, December 25.

After Chriſt.

1 The vulgar Chriſtian era commenced from January 1. the Saviour of the world being then five years of age.
8 Jeſus Chriſt diſputes with the doctors in the temple.
14 A cenſus at Rome, 4,370,000 citizens.
16 Mathematicians and magicians expelled from Rome.
17 Twelve cities in Aſia deſtroyed by an earthquake.
27 Pilate made governor of Judea.
29 Jeſus baptized in Jordan by John.
33 He is crucified at Jeruſalem.
35 St Paul converted.
39 St Matthew writes his goſpel.
Pontius Pilate kills himſelf.
A conjunction of Saturn, Jupiter, and Mars.
40 The name of Chriſtians firſt given at Antioch to the followers of Chriſt.
43 Claudius Cæſar's expedition into Britain.
44 St Mark writes his goſpel
50 London is founded by the Romans: 368, ſurrounded by ditto with a wall, ſome parts of which are ſtill obſervable.
51 Caractacus, the Britiſh king, is carried in chains to Rome.
52 The council of the Apoſtles at Jeruſalem.
55 St Luke writes his goſpel.
56 Rotterdam built.
59 The emperor Nero puts his mother and brothers to death.
---- ——— perſecutes the Druids in Britain.
60 Chriſtianity introduced into Britain.
61 Boadicea, the Britiſh queen, defeats the Romans; but is conquered ſoon after by Suetonius, governor of Britain.
62 St Paul is ſent in bonds to Rome—writes his epiſtles between 51 and 66.
63 The Acts of the Apoſtles written.
A great earthquake in Aſia.
64 Rome ſet on fire, and burned for ſix days; upon which began (under Nero) the firſt perſecution againſt the Chriſtians.

After Chriſt.

65 Many prodigies ſeen about Jeruſalem.
66 St Peter and St Paul put to death.
70 While the factious Jews are deſtroying one another with mutual fury, Titus the Roman general takes Jeruſalem, which is raſed to the ground, and the plough made to paſs over it.
73 The philoſophers baniſhed from Rome by Veſpaſian.
79 The cities of Pompeii and Herculaneum deſtroyed by an eruption of Veſuvius.
80 The Capitol and Pantheon at Rome deſtroyed by fire.
83 The philoſophers expelled Rome by Domitian.
85 Julius Agricola, governor of South-Britain, to protect the civilized Britons from the incurſions of the Caledonians, builds a line of forts between the rivers Forth and Clyde; defeats the Caledonians under Galgacus on the Grampian hills; and firſt ſails round Britain, which he diſcovers to be an iſland.
86 The Capitoline games inſtituted by Domitian.
88 The ſecular games celebrated at Rome.
93 The empire of the Huns in Tartary deſtroyed by the Chineſe.
The Evangeliſt John baniſhed to Patmos.
94 The ſecond perſecution of the Chriſtians, under Domitian.
96 St John the Evangeliſt wrote his Revelation—his Goſpel in 97.
103 Dacia reduced to a Roman province.
105 A great earthquake in Aſia and Greece.
107 The third perſecution of the Chriſtians, under Trajan.
114 Armenia reduced to a Roman province.
A great earthquake in China.
115 Aſſyria ſubdued by Trajan.
An inſurrection of the Jews, who murder 200,000 Greeks and Romans.
A violent earthquake at Antioch.
120 Nicomedia and other cities ſwallowed up by an earthquake.
121 The Caledonians reconquer from the Romans all the ſouthern parts of Scotland; upon which the emperor Adrian builds a wall between Newcaſtle and Carliſle; but this alſo proving ineffectual, Pollius Urbicus, the Roman general, about the year 134, repairs Agricola's forts, which he joins by a wall four yards thick.
130 Jeruſalem rebuilt by Adrian.
132 The ſecond Jewiſh war commenced.
135 The ſecond Jewiſh war ends, when they were all baniſhed Judea.
139 Juſtin writes his firſt apology for the Chriſtians.
141 A number of hereſies appear about this time.
146 The worſhip of Serapis introduced at Rome.
152 The emperor Antoninus Pius ſtops the perſecution againſt the Chriſtians.
An inundation of the Tiber, and an earthquake at Rhodes.
163 The fourth perſecution of the Chriſtians, under Marcus Aurelius Antoninus.
166 The Romans ſent ambaſſadors to China.

168

168 A plague over the known world.

188 The Capitol at Rome deſtroyed by lightning.

191 A great part of Rome deſtroyed by fire.

203 The fifth perſecution of the Chriſtians, under Severus.

205 An earthquake in Wales.

209 Severus's wall in Britain built.

218 Two comets appeared at Rome. The courſe of the moſt remarkable from eaſt to weſt.

222 About this time the Roman empire begins to decline. The barbarians begin their irruptions, and the Goths have annual tribute not to moleſt the empire.

225 Mathematicians allowed to teach publicly at Rome.

236 The ſixth perſecution of the Chriſtians, under Maximin.

241 The Franks firſt mentioned in hiſtory.

250 The ſeventh perſecution, under Decius.

252 A dreadful peſtilence broke out in Ethiopia, and ſpread over the world.

The eighth perſecution, under Gallus.

253 Europe ravaged by the Scythians and Goths.

258 The ninth perſecution, under Valerian.

260 Valerian is taken priſoner by Sapor, king of Perſia, and flayed alive.

The Scythians ravaged the Roman empire.

The temple of Diana at Epheſus burnt.

261 A great plague throughout the Roman empire.

262 Earthquakes in Europe, Aſia, and Africa, and three days of darkneſs.

273 The Romans took Palmyra.

274 Silk firſt brought from India; the manufactory of it introduced into Europe by ſome monks, 551; firſt worn by the clergy in England, 1534.

276 Wines firſt made in Britain.

277 The Franks ſettled in Gaul.

284 The Diocleſian era commenced Auguſt 29th, or September 17th.

287 Carauſius proclaimed emperor of Britain.

289 A great comet viſible in Meſopotamia for 29 days.

291 Two emperors and two Cæſars march to defend the four quarters of the empire.

297 Alexandria deſtroyed by Diocleſian.

303 The tenth perſecution, under Diocleſian.

306 Conſtantine the Great begins his reign.

308 Cardinals firſt began.

312 Peſtilence all over the Eaſt.

Cycle of induction began.

313 The tenth perſecution ends by an edict of Conſtantine, who favours the Chriſtians, and gives full liberty to their religion.

314 Three biſhops, or fathers, are ſent from Britain to aſſiſt at the council of Arles.

315 Crucifixion aboliſhed.

321 Obſervation of Sunday enjoined.

323 The firſt general council at Nice, when 318 fathers attended, againſt Arius, the founder of Arianiſm, where was compoſed the famous Nicene Creed, which we attribute to them.

328 Conſtantine removes the ſeat of empire from Rome to Byzantium, which is thereafter called Conſtantinople.

330 A dreadful perſecution of the Chriſtians in Perſia, which laſts 40 years.

333 Conſtantine orders all the heathen temples to be deſtroyed.

334 Three hundred thouſand Sarmatians revolted from their maſters.

341 The goſpel propagated in Ethiopia by Frumentius.

344 Neocæſarea ruined by an earthquake.

351 The heathens firſt called Pagans.

358 A hundred and fifty cities in Aſia and Greece overturned by an earthquake.

360 The firſt monaſtery founded near Poictiers in France, by Martin.

363 The Roman Emperor Julian, ſurnamed the Apoſtate, endeavours in vain to rebuild the temple of Jeruſalem.

364 The Roman empire is divided into the Eaſtern (Conſtantinople the capital) and Weſtern (of which Rome continued to be the capital), each being now under the government of different emperors.

373 The Bible tranſlated into the Gothic language.

376 The Goths ſettled in Thrace.

379 The cycle of Theophilus commenced.

390 A fiery column ſeen in the air for 30 days.

400 Bells invented by Biſhop Paulinus of Campania.

401 Europe overrun by the Goths, under Alaric.

404 Another irruption of the Goths.

The kingdom of Caledonia, or Scotland, revives under Fergus.

406 Third irruption of the Goths.

The Vandals, Alans, and Suevi, ſpread into France and Spain, by a conceſſion of Honorius, emperor of the Weſt.

408 The Chriſtian religion propagated in Perſia.

409 Rome taken and plundered by the Goths, Auguſt 24.

412 The Vandals begin their kingdom in Spain.

413 The kingdom of Burgundy begun in Alſace.

415 The kingdom of Thoulouſe founded by the Viſigoths.

417 The Alans extirpated by the Goths.

419 Many cities in Paleſtine deſtroyed by an earthquake.

420 The kingdom of France begins upon the Lower Rhine, under Pharamond.

421 The Salique law promulgated.

426 The Romans, reduced to extremities at home, withdraw their troops from Britain, and never return: adviſing the Britons to arm in their own defence, and truſt to their own valour.

432 The goſpel preached in Ireland by St Patrick.

444 All Europe ravaged by the Huns.

446 The Britons, now left to themſelves, are greatly haraſſed by the Scots and Picts, upon which they once more make their complaint to the Romans (which they entitle, *The Groans of the Britons*), but receive no aſſiſtance from that quarter.

447 Attila (ſurnamed the Scourge of God) with his Huns ravage the Roman empire.

449 Vortigern, king of the Britons, invites the Saxons into Britain, againſt the Scots and Picts.

452 The city of Venice founded.

455 The Saxons having repulſed the Scots and Picts, invite over more of their countrymen, and begin to eſtabliſh themſelves in Kent, under Hengiſt.

476 The weſtern empire is finiſhed, 523 years after the battle of Pharſalia; upon the ruins of which ſeveral new ſtates ariſe in Italy and other parts, conſiſting of Goths, Vandals, Huns, and other barbarians, under whom literature is extinguiſhed, and the works of the learned are deſtroyed.

480 A great earthquake at Conſtantinople, which laſted 40 days.

493 Italy reduced by Theodoric king of the Goths.

496 Clovis, king of France, baptized, and Chriſtianity begins in that kingdom.

506 The Jews talmud publiſhed.

508 Prince Arthur begins to reign over the Britons.

510 Paris made the capital of the French dominions.

514 Conſtantinople beſieged by Vitalianus, whoſe fleet is burnt by a ſpeculum of braſs made by Proclus.

516 The computing of time by the Chriſtian era is introduced by Dionyſius the monk.

517 Five years drought and famine in Paleſtine.

519 A bearded comet appears.

529 The codex of Juſtinian, the eaſtern emperor, is publiſhed.

534 The kingdom of the Vandals in Africa comes to an end, after having continued 105 years.

536 The manufacture of ſilk introduced at Conſtantinople by two Indian monks.

540 Antioch deſtroyed by the Perſians.

541 Baſilius the laſt conſul elected at Rome.

532 Antioch rebuilt.

542 An earthquake all over the world.

550 An earthquake in Paleſtine and Syria.

The kingdom of Poland founded.

551 An earthquake in Greece, attended with a great commotion in the ſea.

553 The empire of the Goths in Italy deſtroyed by Narſes.

A great earthquake at Conſtantinople.

557 Another violent earthquake at Conſtantinople, Rome, &c.

A terrible plague all over Europe, Aſia, and Africa, which continues near 50 years.

568 The Lombards founded a kingdom in Italy.

569 The Turks firſt mentioned in hiſtory.

The exarchate of Ravenna begins.

575 The firſt monarchy founded in Bavaria.

580 Antioch deſtroyed by an earthquake.

581 Latin ceaſed to be ſpoken about this time in Italy.

584 The origin of fiefs in France.

588 The city of Paris deſtroyed by fire.

589 Rome overflowed by the Tiber.

593 The Gaſcons eſtabliſh themſelves in the country called by their name.

596 John of Conſtantinople aſſumes the title of univerſal biſhop.

597 Auguſtine the monk comes into England with forty monks.

599 A dreadful peſtilence in Africa.

604 St Paul's church in London founded.

605 The uſe of bells introduced into churches.

606 Here begins the power of the popes, by the conceſſions of Phocas, emperor of the Eaſt.

622 Mahomet, the falſe prophet, flies from Mecca to Medina in Arabia, in the 44th year of his age, and 10th of his miniſtry, when he laid the foundation of the Saracen empire, and from whom the Mahometan princes to this day claim their deſcent. His followers compute their time from this era, which in Arabic is called *hegira*, i. e. "the Flight."

628 An academy founded at Canterbury.

632 The era of Jeſdegird commenced June 16th.

637 Jeruſalem is taken by the Saracens, or followers of Mahomet.

641 Alexandria in Egypt is taken by ditto, and the grand library there burnt by order of Omar, their caliph or prince.

643 The temple of Jeruſalem converted into a Mahometan moſque.

653 The Saracens now extend their conqueſts on every ſide, and retaliate the barbarities of the Goths and Vandals upon their poſterity.

They take Rhodes, and deſtroy the famous Coloſſus.

England invaded by the Danes.

660 Organs firſt uſed in churches.

663 Glaſs invented by a biſhop, and brought into England by a Benedictine monk.

669 Sicily invaded, and Syracuſe deſtroyed by the Saracens.

685 The Britons, after a brave ſtruggle of near 150 years, are totally expelled by the Saxons, and drove into Wales and Cornwall.

698 The Saracens take Carthage, and expel the Romans from Africa.

700 Cracow built, and firſt prince of Poland elected.

704 The firſt province given to the Pope.

713 The Saracens conquer Spain.

714 France governed by Charles Martel.

718 The kingdom of the Aſturias in Spain founded by Pelagio.

719 Chriſtianity promulgated in Germany.

726 The controverſy about images begins, and occaſions many inſurrections in the eaſtern empire.

727 Tax of Peter's pence begun by Ina king of Weſſex.

732 Charles Martel defeats the Saracens near Tours.

735 Inſtitution of the office of Pope's nuncio.

746 Three years peſtilence in Europe and Aſia.

748 The computing of years from the birth of Chriſt began to be uſed in hiſtory.

749 The race of Abbas become caliphs of the Saracens, and encourage learning.

The empire of the Saracens divided into three.

752 The exarchate of Ravenna aboliſhed by Aſtolphus king of the Lombard's.

755 Commencement of the Pope's temporal dominion.

762 The city of Bagdad upon the Tigris is made the capital for the caliphs of the houſe of Abbas.

After Christ.

762 Burials, which formerly uſed to be in highways, permitted in towns.
792 An academy founded in Paris.
794 The Huns extirpated by Charlemagne.
797 Seventeen days of unuſual darkneſs.
800 Charlemagne, king of France, begins the empire of Germany, afterwards called the Weſtern empire; gives the preſent names to the winds and months; endeavours to reſtore learning in Europe; but mankind are not yet diſpoſed for it, being ſolely engroſſed in military enterpriſes.
801 A great earthquake in France, Germany, and Italy.
807 Jan. 31. Jupiter eclipſed by the moon. March 17. A large ſpot ſeen on the ſun for eight days.
808 The firſt deſcent of the Normans on France.
825 The obliquity of the ecliptic obſerved by Benimula to be 23° 55′.
826 Harold, king of Denmark, dethroned by his ſubjects for being a Chriſtian.
The kingdoms of Navarre and Arragon founded.
832 Painters baniſhed out of the eaſtern empire.
836 The Flemings trade to Scotland for fiſh.
840 The Scots and Picts have a deciſive battle, in which the former prevail, and both kingdoms are united by Kenneth, which begins the ſecond period of the Scottiſh hiſtory.
842 Germany ſeparated from the empire of the Franks.
856 An earthquake over the greateſt part of the known world.
861 Ruric the firſt prince of Ruſſia began to reign.
864 The Danes begin their ravages in England.
867 Chriſtianity propagated in Bulgaria.
868 Egypt becomes independent on the caliphs of Bagdad.
872 Bells and clocks firſt uſed in Conſtantinople.
873 France diſtreſſed by locuſts and peſtilence.
874 Iceland peopled by the Norwegians.
Scotland invaded by the Danes.
875 A bearded comet appears in France.
878 Alfred the Great, after ſubduing the Daniſh invaders (againſt whom he fought 56 battles by ſea and land), compoſes his body of laws; divides England into counties, hundreds, tythings; in 890 erects county-courts, having founded the univerſity of Oxford in 886.
880 The obliquity of the ecliptic obſerved by Albategni to be 23° 35′.
889 The Hungarians ſettled near the Danube.
891 The firſt land tax in England.
895 The monaſtery of Cluny founded.
905 A very remarkable comet appeared in China.
Rome taken by the Normans.
911 The obliquity of the ecliptic obſerved by Thebit to be 23° 33′ 30″.
912 The Normans eſtabliſh themſelves in Normandy.
913 The Danes become maſters of England.
915 The univerſity of Cambridge founded.
923 Fiefs eſtabliſhed in France.
925 Sigefroi elected firſt marquis of Brandenburg.
928 The marquiſate of Miſnia eſtabliſhed.

After Christ.

937 The Saracen empire is divided by uſurpation into ſeven kingdoms.
941 Arithmetic brought into Europe.
961 Candia recovered from the Saracens.
967 Antioch recovered from the Saracens.
969 The race of Abbas extinguiſhed in Egypt.
975 Pope Boniface VII. is depoſed and baniſhed for his crimes.
977 Greece, Macedone, and Thrace, ravaged by the Bulgarians for ten years.
The Bohemians ſubdued by Otho.
979 Coronation oath firſt uſed in England.
Juries firſt inſtituted in ditto.
985 The Danes under Sueno invade England and Scotland.
987 The Carlovingian race in France ended.
991 The figures in arithmetic are brought into Europe by the Saracens from Arabia; letters of the alphabet were hitherto uſed.
993 A great eruption of Mount Veſuvius.
995 England invaded by the Danes and Norwegians.
996 Otho III. makes the empire of Germany elective.
999 Boleſlaus, the firſt king of Poland.
The obliquity of the ecliptic obſerved by Aboul Waſi and Abu Hamed to be 23° 35″.
1000 Paper made of cotton rags was in uſe; that of linen rags in 1170; the manufactory introduced into England at Deptford, 1588.
1002 The emperor Henry aſſumed the title of king of the Romans.
1005 All the old churches are rebuilt about this time in a new manner of architecture.
1006 A plague in Europe for three years.
1007 A great eruption of Veſuvius.
The obliquity of the ecliptic obſerved by Albatrunius to be 23° 35′.
1014 Sueno the Dane becomes maſter of England.
Sept. 28. Almoſt all Flanders laid under water by a ſtorm.
1015 Children forbidden by law to be ſold by their parents in England.
1017 Rain of the colour of blood for three days in Aquitain.
1022 A new ſpecies of muſic invented by Aretin.
1035 Togrul-Beg, or Tangrolipix, the Turkiſh ſultan, eſtabliſhes himſelf in Koraſan.
The kingdoms of Caſtile and Arragon began.
1040 The Danes, after ſeveral engagements with various ſucceſs, are about this time driven out of Scotland, and never again return in a hoſtile manner.
Smyrna deſtroyed by an earthquake.
1041 The Saxon line reſtored under Edward the Confeſſor.
1043 The Turks become formidable and take poſſeſſion of Perſia.
The Ruſſians come from Scythia, and land in Thrace.
1054 Leo IX. the firſt pope that kept up an army.
1055 The Turks take Bagdad, and overturn the empire of the Saracens.
1057 Malcolm III. king of Scotland, kills the tyrant Macbeth at Dunſinnan, and marries the princeſs Margaret, ſiſter to Edgar Atheling.

1061 Surnames appointed to be taken in Scotland by a parliament held in Forfar.

1065 The Turks take Jeruſalem from the Saracens.

1066 The conqueſt of England by William (ſurnamed the Baſtard) duke of Normandy, in the battle of Haſtings, where Harold is ſlain.

1070 The feudal law introduced into England.

1075 Henry IV. emperor of Germany, and the pope, quarrel about the nomination of the German biſhops. Henry, in penance, walks barefooted to the pope towards the end of January.

1076 Juſtices of the peace firſt appointed in England.

An earthquake in England.

Aſia Minor, having been two years under the power of Soliman, is from this time called Turkey.

1080 Doomſday-book began to be compiled by order of William, from a ſurvey of all the eſtates in England, and finiſhed in 1086.

The tower of London build by ditto, to curb his Engliſh ſubjects; numbers of whom fly to Scotland, where they introduce the Saxon or Engliſh language, are protected by Malcolm, and have lands given them.

1086 The order of Carthuſians eſtabliſhed by Bruno.

1090 The dynaſty of Bathineens or Aſſaſſins begins in Irak, and continues for 117 years.

1091 The Saracens in Spain, being hard preſſed by the Spaniards, call to their aſſiſtance Joſeph king of Morocco; by which the Moors get poſſeſſion of all the Saracen dominions in Spain.

1096 The firſt cruſade to the Holy Land is begun under ſeveral Chriſtian princes, to drive the infidels from Jeruſalem.

1098 The order of St Benedict inſtituted.

1099 Jeruſalem taken by the cruſaders; Godfrey elected king of it; and the order of knights of St John inſtituted.

1110 Edgar Atheling, the laſt of the Saxon princes, dies in England, where he had been permitted to reſide as a ſubject.

Learning revived at Cambridge.

Writing on paper made of cotton common about this time.

1118 The order of the Knights Templars inſtituted, to defend the Sepulchre at Jeruſalem, and to protect Chriſtian ſtrangers.

1119 Bohemia erected into a kingdom.

1132 The kingdom of Portugal began.

1137 The pandect of Juſtinian found in the ruins of Amalphi.

1141 The factions of the Guelphs and Gibellines prevailed about this time.

1143 The Koran tranſlated into Latin.

1144 The Peripatetic philoſophy introduced into Germany.

1151 The canon law collected by Gratian, a monk of Bologna.

1154 Chriſtianity introduced into Finland.

1156 The city of Moſcow in Ruſſia founded.

1156 The order of the Carmelites inſtituted.

1163 London bridge, conſiſting of 19 ſmall arches, firſt built of ſtone.

1164 The Teutonic order of religious knights begins in Germany.

1171 The dynaſty of the Fatemites ended in Egypt; the ſovereigns of the country henceforth called Sultans.

1172 Henry II. king of England (and firſt of the Plantagenets), takes poſſeſſion of Ireland; which from that period has been governed by an Engliſh viceroy or lord-lieutenant.

1176 England is divided by Henry into ſix circuits, and juſtice is diſpenſed by itinerant judges.

1179 The univerſity of Padua founded.

1180 Glaſs windows began to be uſed in private houſes in England.

1181 The laws of England are digeſted about this time by Glanville.

1182 Pope Alexander III. compelled the kings of England and France to hold the ſtirrups of his ſaddle when he mounted his horſe.

1183 Seven thouſand Albigenſes maſſacred by the inhabitants of Berry.

1186 A conjunction of all the planets at ſunriſe September 16. The ſun in 30° ♍; Jupiter in 2° 3′ ♎; Venus in 3° 49′; Saturn in 8° 6′; Mercury in 4° 10′; Mars, 9° 8′; tail of the Dragon, 18° 23′ ♎.

1187 Jeruſalem taken by Saladin.

1192 The battle of Aſcalon, in Judea, in which Richard, king of England, defeats Saladin's army, conſiſting of 300,000 combatants.

1194 *Dieu et mon Droit*, firſt uſed as a motto by Richard, on a victory over the French.

1195 Denmark and Norway laid waſte by a dreadful tempeſt.

1198 Inſtitution of the order of the Holy Trinity.

1200 Chimnies were not known in England.

Surnames now began to be uſed; firſt among the nobility.

Univerſity of Salamanca in Spain founded.

1204 Conſtantinople taken by the French and Venetians.

The inquiſition eſtabliſhed.

The empire of Trebizond eſtabliſhed.

1208 London incorporated, and obtained their firſt charter, for electing their lord mayor and other magiſtrates from King John.

The order of *Fratres Minores* eſtabliſhed.

The pope excommunicates King John.

1209 The works of Ariſtotle imported from Conſtantinople into Europe.

The ſilk manufacture imported from Greece into Venice.

1210 The works of Ariſtotle condemned to be burnt at Paris.

The emperor Otho excommunicated by the pope.

Violent perſecution of the Albigenſes.

1215 Magna Charta is ſigned by King John and the barons of England.

Court of common pleas eſtabliſhed.

Orders of the Dominicans and Knights Hoſpitallers founded.

The doctrine of tranſubſtantiation introduced.

1216 King Alexander and the whole kingdom of Scotland excommunicated by the pope's legate.

1220 Aſtronomy and geography brought into Europe by the Moors.
1222 A great earthquake in Germany.
1223 A comet of extraordinary magnitude appeared in Denmark.
1226 A league formed againſt the Albigenſes by the French king and many prelates and lords.
1227 The Tartars under Jenghiz khan emerge from the northern parts of Aſia, overrun all the Saracen empire, and carry death and deſolation wherever they march.
1228 The univerſity of Thoulouſe founded.
1230 The kingdom of Denmark diſtreſſed by peſtilence.
The kingdoms of Leon and Caſtile united.
Pruſſia ſubdued by the Teutonic knights.
Univerſity of Naples founded.
1231 The Almageſt of Ptolemy tranſlated into Latin.
1233 The Inquiſition, begun in 1204, is now truſted to the Dominicans.
The houſes of London, and other cities in England, France, and Germany, ſtill thatched with ſtraw.
1238 The univerſity of Vienna founded.
1239 A writing of this year's date on paper made of rags ſtill extant.
1241 The Hanſeatic league formed.
Tin mines diſcovered in Germany.
1245 A clear red ſtar, like Mars, appears in Capricorn.
1250 Painting revived in Florence by Cimabue
1251 Wales ſubdued, and Magna Charta confirmed.
1253 The famous aſtronomical tables are compoſed by Alonſo king of Caſtile.
1256 The order of the Auguſtines eſtabliſhed.
1258 The Tartars take Bagdad, which finiſhes the empire of the Saracens.
1260 The ſect of Flagellantes appeared in Italy.
1263 Acho king of Norway invades Scotland with 160 ſail, and lands 20,000 men at the mouth of the Clyde; but they are cut to pieces by Alexander III. who recovers the weſtern iſles.
1264 The commons of England firſt ſummoned to parliament about this time.
1268 The Tartars invade China.
1269 The Hamburgh company incorporated in England.
The obliquity of the ecliptic obſerved by Cozah Naſirodni to be 23° 30′.
Weſtminſter abbey rebuilt, and conſecrated in the preſence of Henry III.
1272 The academy of Florence founded.
1273 The empire of the preſent Auſtrian family begins in Germany.
The obliquity of the ecliptic obſerved by Cheouking in China to be 23° 33′ 39″.
1274 The firſt commercial treaty betwixt England and Flanders.
1279 King Edward renounced his right to Normandy.
The mortmain act paſſed in England.
1282 Lewellyn, Prince of Wales, defeated and killed by Edward I. who unites that principality to England.
A great peſtilence in Denmark.
8000 French murdered at the Sicilian veſpers.
Academy de la Cruſca founded.
1284 Edward II. born at Caernarvon, is the firſt prince of Wales.
1285 Alexander III. king of Scotland, dies, and that kingdom is diſputed by twelve candidates, who ſubmit their claims to the arbitration of Edward king of England; which lays the foundation of a long and deſolating war between both nations.
1290 The univerſity of Liſbon founded.
1291 Ptolemais taken by the Turks. End of the cruſades.
1293 There is a regular ſucceſſion of Engliſh parliaments from this year, being the 22d of Edward I.
1294 Parliament eſtabliſhed in Paris.
1298 The preſent Turkiſh empire begins in Bithynia under Ottoman.
Silver-hafted knives, ſpoons, and cups, a great luxury.
Tallow-candles ſo great a luxury, that ſplinters of wood were uſed for lights.
Wine ſold by apothecaries as a cordial.
The Scots defeated by the Engliſh at Falkirk.
1299 An earthquake in Germany.
Spectacles invented by a monk of Piſa.
The year of jubilee inſtituted by Boniface VIII.
1302 The mariner's compaſs invented, or improved, by Giovia of Naples.
The univerſity of Avignon founded.
1307 The beginning of the Swiſs cantons.
Coal firſt uſed in England.
1308 The popes removed to Avignon in France for 70 years.
1310 Lincoln's Inn ſociety eſtabliſhed.
The knights of St John take poſſeſſion of the iſle of Rhodes.
1314 The battle of Bannockburn, between Edward II. and Robert Bruce, which eſtabliſhes the latter on the throne of Scotland.
The cardinals ſet fire to the conclave and ſeparate.
A vacancy in the papal chair for two years.
1315 Germany afflicted with famine and peſtilence.
1319 The univerſity of Dublin founded.
1320 Gold firſt coined in Chriſtendom; 1344 ditto in England.
An earthquake in England.
1323 A great eruption of Mount Ætna.
1325 The firſt treaty of commerce betwixt England and Venice.
1330 Gunpowder invented by a monk of Cologne.
1332 The pope accuſed of hereſy.
1336 Two Brabant weavers ſettled at York, which, ſays Edward III. may prove of great benefit to us and our ſubjects.
1337 The firſt comet whoſe courſe is deſcribed with an aſtronomical exactneſs.
Europe infeſted by locuſts.
1340 Heralds college inſtituted in England.
Copper money firſt uſed in Scotland and Ireland.
1344 The firſt creation to titles by patents uſed by Edward III.
1345 Edward III. had four pieces of cannon, which gained him the battle of Creſſy.
1347 The battle of Durham, in which David, king of Scots, is taken priſoner.

1349 The order of the Garter inſtituted in England by Edward III. altered in 1557, and conſiſts of 26 knights.

1352 The Turks firſt enter Europe.

1353 Aſia and Africa deſolated by locuſts.

1354 The money in Scotland till now the ſame as in England.

1356 The battle of Poictiers, in which King John of France and his ſon are taken priſoners by Edward the Black Prince.

1357 Coals firſt brought to London.

1358 Arms of England and France firſt quartered by Edward III.

Univerſity of Cologne founded.

Tamerlane began to reign in Perſia.

1362 The law pleadings in England changed from French to Engliſh in favour of Edward III. to his people.

The military order of Janizaries eſtabliſhed among the Turks.

1365 The univerſities of Vienna and Geneva founded.

1369 John Wickliffe an Engliſhman begins to call in queſtion the doctrines of the church of Rome about this time, whoſe followers are called Lollards.

1370 The office of grand vizir eſtabliſhed.

1377 Inundation of the ſea in Flanders.

1378 Greenland diſcovered by a Venetian.

1381 Bills of exchange firſt uſed in England.

1384 The firſt act of navigation in England; no goods to be exported or imported by Engliſhmen in foreign bottoms.

1386 A company of linen weavers from the Netherlands eſtabliſhed in London.

Windſor caſtle built by Edward III.

1387 The firſt Lord High Admiral of England inſtituted.

1388 The battle of Otterburn between Hotſpur and the earl of Douglas.

Bombs invented at Venloo.

1391 Cards invented in France for the king's amuſement.

1399 Weſtminſter abbey rebuilt and enlarged—Weſtminſter hall ditto.

Order of the Bath inſtituted at the coronation of Henry IV. renewed in 1725, conſiſting of 84 knights.

1402 Tamerlane defeats and takes priſoner Bajazet the Turkiſh ſultan.

1405 The Canary iſlands diſcovered by Bathencourt a Norman.

1410 Guildhall, London, built.

Painting in oil-colours invented at Bruges by John Van-eyck.

1411 The univerſity of St Andrew's in Scotland founded.

1412 Algebra brought from Arabia into Europe.

1415 The battle of Agincourt gained over the French by Henry V. of England.

1420 The iſland of Madeira diſcovered by the Portugueſe.

1421 The revenue of England amounted to 55,754l.

1428 The ſiege of Orleans, the firſt blow to the Engliſh power in France.

1431 A great earthquake at Liſbon.

1432 Great inundations in Germany.

1427 The obliquity of the ecliptic obſerved by Ulug Beg to be 23° 30′ 17″.

1440 Printing invented by L. Koſter at Haerlem in Holland; brought into England by W. Caxton, a mercer of London, 1471.

1446 The Vatican library founded at Rome.

The ſea breaks in at Dort in Holland and drowns 100,000 people.

1453 Conſtantinople taken by the Truks, which ends the eaſtern empire, 1123 years from its dedication by Conſtantine the Great, and 2206 years from the foundation of Rome.

1454 The univerſity of Glaſgow in Scotland founded.

1457 Glaſs firſt manufactured in England.

1460 Engraving and etching on copper invented.

The obliquity of the ecliptic obſerved by Purbachius and Regiomontanus to be 23° 29′.

1473 The ſtudy of the Greek language introduced into France.

1477 The univerſity of Aberdeen in Scotland founded.

1479 Union of the kingdoms of Arragon and Caſtile.

1482 The coaſt of Guinea diſcovered by the Portugueſe.

A court of inquiſition erected in Seville.

1485 Richard III. king of England, and laſt of the Plantagenets, is defeated and killed at the battle of Boſworth, by Henry (Tudor) VII. which put at end to the civil wars between the houſes of York and Lancaſter, after a conteſt of 30 years, and the loſs of 100,000 men.

1487 Henry eſtabliſhes fifty yeomen of the guards, the firſt ſtanding army.

1489 Maps and ſea charts firſt brought to England by Barth. Columbus.

1490 William Groceyn introduces the ſtudy of the Greek language into England.

The Moors, hitherto a formidable enemy to the native Spaniards, are entirely ſubdued by Ferdinand, and become ſubjects to that prince on certain conditions, which are ill obſerved by the Spaniards, whoſe clergy uſe the inquiſition in all its tortures; and in 1609, near one million of the Moors were driven from Spain to the oppoſite coaſt of Africa, from whence they originally came.

1492 America firſt diſcovered by Columbus, a Genoeſe in the ſervice of Spain.

The Moors expelled from Granada, which they had poſſeſſed upwards of 800 years.

1495 The venereal diſeaſe introduced into Europe.

1496 The Jews and Moors baniſhed out of Portugal.

1497 The Portugeſe firſt ſail to the Eaſt Indies by the Cape of Good Hope.

South America diſcovered by Americus Veſpuſius, from whom unjuſtly it has its name.

1499 North America diſcovered, for Henry VII. by Cabot, a Venetian.

1500 Maximilian divides the empire of Germany into ſix circles, and adds four more in 1512.

Brazil diſcovered by the Portugueſe. Florida diſcovered by John Cabot, an Engliſhman.

Painting in chiaro-obſcuro diſcovered.

A great plague in England.

1505 Shillings firſt coined in England.

1507 The iſland of Madagaſcar diſcovered by the Portugueſe.

1509 Gardening introduced into England from the Netherlands, from whence vegetables were imported hitherto.

1510 The obliquity of the ecliptic obſerved by Wernenus to be 23° 28′ 30″.

1513 The battle of Flowden, in which James IV. king of Scotland is killed, with the flower of his nobility.

1514 Cannon bullets of ſtone ſtill in uſe.

1515 The firſt Polyglot Bible printed at Alcala.

The kingdom of Navarre annexed to that of Caſtile by Ferdinand.

1516 The kingdom of Algiers ſeized by Barbaroſſa.

1517 Martin Luther began the reformation.

Egypt is conquered by the Turks.

The kingdom of the Mamelukes in Egypt overthrown by the Turks.

1518 Diſcovery of New Spain, and the Straits of Magellan.

1521 Henry VII. for his writings in favour of popery, receives the title of Defender of the Faith from his Holineſs.

1522 Rhodes taken by the Turks.

The firſt voyage round the world performed by a ſhip of Magellan's ſquadron.

1526 The inquiſition eſtabliſhed in Portugal.

Lutheraniſm eſtabliſhed in Germany.

1527 Rome taken and plundered by the Imperial army.

1528 Popery aboliſhed in Sweden.

1529 The name of Proteſtant takes its riſe from the reformers proteſting againſt the church of Rome, at the diet of Spires in Germany.

1530 Union of the Proteſtants at Smallcalde, December 22d.

Secretary of State's office eſtabliſhed in England.

1531 A great earthquake at Liſbon.

1532 The Court of Seſſion inſtituted in Scotland.

1533 Inſurrection of the Anabaptiſts in Weſtphalia.

1534 The reformation takes place in England, under Henry VIII.

Barbaroſſa ſeized on the kingdom of Tunis.

1535 The reformation introduced into Ireland.

The ſociety of Jeſuits formed.

1539 The firſt Engliſh edition of the Bible authoriſed; the preſent tranſlation finiſhed in 1611.

About this time cannon began to be uſed in ſhips.

Six hundred and forty-five religious houſes ſuppreſſed in England and Wales.

1540 The variation of the compaſs diſcovered by Sebaſtian Cabot.

The obliquity of the ecliptic obſerved by Copernicus to be 23° 28′ 8″.

Society of the Jeſuits eſtabliſhed, September 27.

1543 Silk ſtockings firſt worn by the French king; firſt worn in England by Queen Eliz. 1561; the ſteel frame for weaving invented by the Rev. Mr Lee, of St. John's College, Cambridge, 1589.

Pins firſt uſed in England, before which time the ladies uſed ſkewers.

Iron cannon and mortars made in England.

1544 Good lands let in England at one ſhilling per acre.

1545 The famous council of Trent begins, and continues 18 years.

1547 Firſt law in England eſtabliſhing the intereſt of money at 10 per cent.

1548 The reformation gained ground in Poland.

1549 Lords lieutenants of counties inſtituted in England.

1550 Horſe guards inſtituted in England.

The bank of Venice eſtabliſhed about this time.

1552 Books of geography and aſtronomy deſtroyed in England, as being infected with magic.

The book of Common Prayer eſtabliſhed in England by act of parliament.

1554 The kingdom of Aſtracan conquered by the Ruſſians.

1555 The Ruſſian company eſtabliſhed in England.

1558 Queen Elizabeth begins her reign.

1560 The Reformation in Scotland completed by John Knox.

1561 Livonia ceded to Poland.

1563 Knives firſt made in England.

1565 Revolt of the Low Countries.

Malta attacked by the Turks.

1566 The 39 articles of the church of England eſtabliſhed.

1568 Queen Mary impriſoned in England.

Liberty of profeſſing the reformed religion granted to the Low Countries.

1569 Royal Exchange firſt built.

1571 The iſland of Cyprus taken by the Turks.

They are defeated at Lepanto.

1572 The great maſſacre of Proteſtants at Paris.

A new ſtar in Caſſiopeia obſerved by Cornelius Gamma. It appeared in November, and diſappeared in March.

1576 The profeſſion of the Proteſtant religion authoriſed in France. This toleration followed by a civil war.

1578 The firſt treaty of alliance betwixt England and the States General, January 7.

1579 The Dutch ſhake off the Spaniſh yoke, and the republic of Holland begins.

Engliſh Eaſt India company incorporated—eſtabliſhed 1600.

——— Turkey company incorporated.

1580 Sir Francis Drake returns from his voyage round the world, being the firſt Engliſh circumnavigator.

Parochial regiſter firſt appointed in England.

The kingdom of Portugal ſeized by Philip of Spain.

1581 Copper firſt uſed in France.

1582 Pope Gregory introduces the New Style in Italy; the 5th of October being counted the 15th.

1583 Tobacco firſt brought from Virginia into England.

The firſt propoſal of ſettling a colony in America.

1587 Mary Queen of Scots is beheaded by order of Elizabeth, after 18 years impriſonment.

1588 The Spaniſh Armada deſtroyed by Drake and other Engliſh admirals.

Henry IV. paſſes the edict of Nantes, tolerating the Proteſtants.

1588 Duelling with ſmall ſwords introduced into England.

1589 Coaches firſt introduced into England; hackney act 1693; increaſed to 1000 in 1770.

1590 Band of penſioners inſtituted in England.

Teleſcopes invented by Janſen, a ſpectacle-maker in Germany.

1591 Trinity College, Dublin, founded.

1593 A great plague in London.

1594 The Jeſuits expelled from France.

The obliquity of the ecliptic obſerved by Byrgius to be 23° 30′

1595 The ſame obſerved by Tycho-Brahe to be 23° 29′ 25″

1596 A great earthquake at Japan.

1597 Watches firſt brought into England from Germany.

1598 The edict of Nantes by Henry IV. of France.

1602 Decimal arithmetic invented at Bruges.

1603 Queen Elizabeth (the laſt of the Tudors) dies, and nominates James VI. of Scotland as her ſucceſſor; which unites both kingdoms under the name of Great Britain.

1605 The Gunpowder-plot diſcovered at Weſtminſter; being a project to blow up the king and both houſes of parliament.

1606 Oaths of allegiance firſt adminiſtered in Britain.

1608 Colonies ſent from Britain to Virginia.

1609 The independency of the United States acknowledged by Spain.

1610 Galileo, of Florence, firſt diſcovers the ſatellites about the planet Jupiter, by the teleſcope, lately invented in Germany.

Henry IV. is murdered at Paris, by Ravaillac, a prieſt.

Thermometers invented by Drebel, a Dutchman.

1611 Baronets firſt created in Britain by James I. May 22.

An earthquake in Conſtantinople; 200,000 perſons died there of the plague.

1612 The north-weſt paſſage to China attempted in vain by the Britiſh.

1614 Napier of Marcheſton, in Scotland, invents the logarithms.

Sir Hugh Middleton brings the new river to London from Ware.

1616 The firſt permanent ſettlement in Virginia.

1619 W. Harvey, an Engliſhman, confirms the doctrine of the circulation of the blood, which had been firſt broached by Servetius, a French phyſician, in 1553.

1620 The broad ſilk manufacture from raw ſilk, introduced into England.

Barbadoes diſcovered by Sir William Courteen.

Navarre united to France.

Copper money firſt introduced in England.

1621 New England planted by the Puritans.

The two parties of Whigs and Tories formed in Britain.

1622 The Palatinate reduced by the Imperialiſts.

1623 The Knights of Nova Scotia inſtituted.

1624 Maſſacre of the Engliſh at Amboyna.

1625 King James dies, and is ſucceeded by his ſon, Charles I.

1625 The iſland of Barbadoes, the firſt Britiſh ſettlement in the Weſt Indies, is planted.

1631 The tranſit of Mercury over the ſun's diſk, firſt obſerved by Gaſſendi.

A great eruption of Veſuvius.

1632 The battle of Lutzen, in which Guſtavus Adolphus, king of Sweden, and head of the Proteſtants in Germany, is killed.

1633 Galileo condemned by the inquiſition at Rome.

Louſiana diſcovered by the French.

1635 Province of Maryland planted by Lord Baltimore.

Regular poſts eſtabliſhed from London to Scotland, Ireland, &c.

1636 A tranſit of Mercury over the ſun's diſk obſerved by Caſſini.

1639 A tranſit of Venus over the ſun's diſk, firſt obſerved by Mr Horrox, November 24. O. S. 3 h. 15′ P. M.

1640 King Charles diſobliges his Scottiſh ſubjects; on which their army, under General Leſley, enters England, and takes Newcaſtle, being encouraged by the malecontents in England.

The maſſacre in Ireland, when 40,000 Engliſh Proteſtants were killed.

The independency of Portugal recovered by John duke of Braganza.

1642 King Charles impeaches five refractory members, which begins the cival wars in England.

1643 Exciſe on beer, ale, &c. firſt impoſed by parliament.

Barometers invented by Torricelli.

1648 A new ſtar obſerved in the tail of the Whale by Fabricius.

1649 Charles I. beheaded by Cromwell at Whitehall, January 30. aged 49.

Pendulums firſt applied to clocks by Huygens.

1651 The ſect called *Quakers* appeared in England.

1652 The Dutch colony at the Cape of Good Hope eſtabliſhed.

1653 Cromwell aſſumes the protectorſhip.

The air-pump is invented by Otto Guericke of Magdeburg.

1655 The Engliſh under Admiral Penn, take Jamaica from the Spaniards.

One of Saturn's ſatellites obſerved by Huygens.

1658 Cromwell dies, and is ſucceeded in the protectorſhip by his ſon Richard.

1660 King Charles II. is reſtored by Monk, commander of the army, after an exile of twelve years in France and Holland.

The people of Denmark, being oppreſſed by the nobles, ſurrendered their privileges to Frederic III. who becomes abſolute.

1661 The obliquity of the ecliptic obſerved by Hevelius to be 23° 29′ 7″.

1662 The royal ſociety eſtabliſhed at London by Charles II.

1663 Carolina planted: 1728, divided into two ſeparate governments.

Pruſſia declared independent of Poland.

1664 The New Netherlands in North America conquered from the Swedes and Dutch by the Engliſh.

1665 The plague rages in London, and carries off 68,000 perſons.
The Magic lantern invented by Kircher.
1666 The great fire of London began Sept. 2. and continued three days, in which were deſtroyed 13,000 houſes and 400 ſtreets.
Tea firſt uſed in England.
1667 The peace of Breda, which confirms to the Engliſh the New Netherlands, now known by the names of Pennſylvania, New York, and New-Jerſey.
1668 ——— ditto, Aix-la-Chapelle.
St James's Park planted and made a thoroughfare for public uſe by Charles II.
1669 The iſland of Candia taken by the Turks.
1670 The Engliſh Hudſon's Bay company incorporated.
The obliquity of the ecliptic obſerved by Mengoli to be 23° 28′ 24″.
1672 Louis XIV. overruns great part of Holland, when the Dutch open their ſluices, being determined to drown their country, and retire to their ſettlements in the Eaſt Indies.
African company eſtabliſhed.
The obliquity of the ecliptic obſerved by Richer to be 23° 28′ 54″.
1677 The micrometer invented by Kircher.
1678 The peace of Nimeguen.
The habeas corpus act paſſed.
A ſtrange darkneſs at noonday, Jan. 12.
1680 A great comet appeared, and from its nearneſs to our earth alarmed the inhabitants. It continued viſible from Nov. 3. to March 9.
William Penn, a Quaker, receives a charter for planting Pennſylvania.
1683 India ſtock ſold from 360 to 500 per cent.
1685 Charles II. dies, aged 55, and is ſucceeded by his brother James II.
The duke of Monmouth, natural ſon to Charles II. raiſes a rebellion, but is defeated at the battle of Sedgmore, and beheaded.
The edict of Nantes is revoked by Louis XIV. and the Proteſtants are greatly diſtreſſed.
1686 The Newtonian philoſophy publiſhed.
1687 The palace of Verſailles, near Paris, finiſhed by Louis XIV.
1688 The revolution in Great Britain begins Nov. 5. King James abdicates, and retires to France, December 23.
King William and Queen Mary, daughter and ſon-in-law to James, are proclaimed February 13.
Viſcount Dundee ſtands out for James in Scotland, but is killed by General Mackay at the battle of Killycrankie; upon which the Highlanders, wearied with repeated misfortunes, diſperſe.
Smyrna deſtroyed by an earthquake.
1689 The land-tax paſſed in England.
The toleration act paſſed in ditto.
William Fuller, who pretended to prove the prince of Wales ſpurious, was voted by the commons to be a notorious cheat, impoſtor, and falſe accuſer.
Several biſhops are deprived for not taking the oaths to William.
1689 Epiſcopacy aboliſhed in Scotland.
1690 The battle of the Boyne, gained by William againſt James, in Ireland.
1691 The war in Ireland finiſhed by the ſurrender of Limeric to William.
The obliquity of the ecliptic obſerved by Flamſtead to be 23° 28′ 32″.
1692 The Engliſh and Dutch fleets, commanded by Admiral Ruſſel, defeat the French fleet off La Hogue.
The maſſacre of Glencoe in Scotland, Jan. 31. O. S.
Earthquakes in England and Jamaica, September 8.
Hanover made an electorate of the empire.
1693 Bayonets at the end of loaded muſkets firſt uſed by the French againſt the confederates in the battle of Turin.
Bank of England eſtabliſhed by King William.
The firſt public lottery was drawn this year.
1694 Queen Mary dies at the age of 33, and William reigns alone.
Stamp-duties inſtituted in England.
1697 The peace of Ryſwick.
1699 The Scots ſettled a colony at the iſthmus of Darien in America, and called it *Caledonia*.
1700 Charles XII. of Sweden begins his reign.
1701 King James II. dies at St Germains, in the 68th year of his age.
Pruſſia erected into a kingdom.
Society for the propagation of the goſpel in foreign parts eſtabliſhed.
1702 King William dies, aged 50, and is ſucceeded by Queen Anne, daughter to James II. who, with the emperor and ſtates general, renews the war againſt France and Spain.
The French ſent colonies to the Miſſiſſippi.
1703 The obliquity of the ecliptic obſerved by Bianchini to be 23° 28′ 25″.
1704 Gibraltar taken from the Spaniards by Admiral Rooke.
The battle of Blenheim won by the duke of Marlborough and allies againſt the French.
The Court of Exchequer inſtituted in England.
1706 The treaty of union betwixt England and Scotland, ſigned July 22.
The battle of Ramillies won by Marlborough and the allies.
1707 The firſt Britiſh parliament.
The allies defeated at Almanza.
1708 Minorca taken from the Spaniards by General Stanhope.
The battle of Oudenarde won by Marlborough and the allies.
1709 Peter the Great, czar of Moſcovy, defeats Charles XII. at Poltowa, who flies to Turkey.
The battle of Malplaquet won by Marlborough and the allies.
1710 Queen Anne changes the Whig miniſtry for others more favourable to the intereſt of her brother the late pretender.
The cathedral church of St Paul, London, rebuilt by Sir Chriſtopher Wren in 37 years, at one million expence, by a duty on coals.
The Engliſh South-ſea company began.

1712 Duke of Hamilton and Lord Mohun killed in a duel in Hyde-park.

1713 The peace of Utrecht, whereby Newfoundland, Nova Scotia, New Britain, and Hudſon's Bay in North America, were yielded to Great Britain; Gibralter and Minorca in Europe were alſo confirmed to the ſaid crown by this treaty.

1714 Queen Anne dies at the age of 50, and is ſucceeded by George I.

Intereſt reduced to five per cent.

1715 Louis XIV. dies, and is ſucceeded by his great-grandſon Louis XV.

The rebellion in Scotland begins in September, under the earl of Mar, in favour of the Pretender. The action of Sheriffmuir, and the ſurrender of Preſton, both in November, when the rebels diſperſe.

The obliquity of the ecliptic obſerved by Louville to be 23° 28′ 24″.

1716 The pretender married the princeſs of Sobieſka, grand-daughter of John Sobieſki, late king of Poland.

An act paſſed for ſeptennial parliaments.

1718 Sardinia erected into a kingdom, and given to the duke of Savoy.

1719 The Miſſiſſippi ſcheme at its height in France.

Lomb's ſilk-throwing machine, containing 26,586 wheels, erected at Derby: takes up one-eighth of a mile; one water-wheel moves the reſt; and in twenty-four-hours it works 318,504,960 yards of organzine ſilk-thread.

1720 The South-ſea ſcheme in England begun April 7. was at its height at the end of June, and quite ſunk about September 29.

A great earthquake in China.

1724 An earthquake in Denmark.

1727 King George dies, in the 68th year of his age; and is ſucceeded by his only ſon, George II.

Inoculation firſt tried on criminals with ſucceſs.

Ruſſia, formerly a dukedom, is now eſtabliſhed as an empire.

The aberration of the fixed ſtars diſcovered and accounted for by Dr Bradley.

1732 Kouli Khan uſurps the Perſian throne, conquers the Mogul empire, and returns with two hundred and thirty-one millions ſterling.

Several public-ſpirited gentlemen begin the ſettlement of Georgia in North America.

1733 The Jeſuits expelled from Paraguay.

1736 Captain Porteous having ordered his ſoldiers to fire upon the populace at the execution of a ſmuggler, is himſelf hanged by the mob at Edinburgh.

A tranſit of Mercury obſerved by Caſſini.

1737 A dreadful hurricane at the mouth of the Ganges, October 10.

1738 Weſtminſter-bridge, conſiſting of 15 arches, begun; finiſhed in 1750 at the expence of 389,000l. defrayed by parliament.

The order of St Januarius eſtabliſhed at Naples.

1739 Letters of marque iſſued out in Britain againſt Spain July 21. and war declared, Oct. 23.

The empire of Indoſtan ruined by Kouli Khan.

An intenſe froſt in Britain.

1743 The battle of Dettingen won by the Engliſh and allies in favour of the queen of Hungary.

1743 A dreadful plague in Sicily.

1744 War declared againſt France.—Commodore Anſon returns from his voyage round the world.

1745 The allies loſe the battle of Fontenoy.

The rebellion breaks out in Scotland, and the Pretender's army defeated by the duke of Cumberland at Culloden, April 16. 1746.

1746 Britiſh Linen Company erected.

Lima deſtroyed by an earthquake.

1747 Kouli Khan murdered.

1748 The peace of Aix la-Chapelle, by which a reſtitution of all places taken during the war was to be made on all ſides.

1749 The intereſt on the Britiſh funds reduced to three per cent.

Britiſh herring-fiſhery incorporated.

The colony of Nova Scotia founded.

1750 Earthquake in England.

1751 Frederic prince of Wales, father to his preſent majeſty, died.

Antiquarian Society at London incorporated.

1752 The new ſtile introduced into Great Britain; the 3d of September being counted the 14th.

1753 The Britiſh Mueſeum erected at Montague-houſe

Society of arts, manufactures, and commerce, inſtituted in London.

1754 A dreadful eruption of Mount Ætna.

A great earthquake at Conſtantinople, Cairo, &c. Sept. 2.

1755 Quito in Peru deſtroyed by an earthquake, April 28.

Liſbon deſtroyed by an earthquake, Nov. 1.

1756 146 Egliſhmen are confined in the black hole at Calcutta in the Eaſt Indies by order of the Nabob, and 123 found dead next morning.

Marine ſociety eſtabliſhed at London.

The king of Pruſſia commenced hoſtilities in the month of Auguſt in Saxony. Defeats the Auſtrians at Lo.

1757 Damien attempted to aſſaſſinate the French king.

The king of Pruſſia invades Bohemia. Defeats the Auſtrians at Reichenberg. April 21. and at Prague, May 6. Repulſed by Count Daun at Kolin, June 18.

The allies defeated by the French at Haſtenbeck, July 26.

Convention of Gloſter-Seven, Sept 8.

The king of Pruſſia defeats the French and Auſtrians at Roſbach, Nov. 5. The Pruſſians defeated near Breſlaw, Nov. 22. The Auſtrians defeated at Liſſa, Dec. 5.

1738 Senegal taken by the Britiſh, May 1. They take Louiſbourg, July 27.

The king of Pruſſia defeats the Ruſſians at Zorndorf, Aug. 25. Is defeated by Count Daun at Hoch-kirchen, Oct. 14.

Goree taken by Commodore Keppel, Dec. 29.

Attempt to aſſaſſinate the king of Portugal, Dec. 3.

1759 General Wolfe is killed in the battle of Quebec, which is gained by the Britiſh.

The French defeated by Prince Ferdinand at Bergen, April 13

Guadaloupe taken by the Britiſh, May 1.

King of Pruſſia defeated by the Ruſſians at Cunerſdorf, Aug. 12.

1759 The French Fleet defeated by Admiral Hawke, Nov. 20.

Balbec and Tripoli deſtroyed by an earthquake, Dec. 5.

1760 King George II. dies Oct. 25. in the 77th year of his age, and is ſucceeded by his preſent majeſty, who, on the 22d September 1761, married the princeſs Charlotte of Mecklenburgh Strelitz.

Blackfriars bridge, conſiſting of 9 arches, begun; finiſhed 1770, at the expence of 152,840l. to to be diſcharged by a toll.

1761 A tranſit of Venus over the ſun, June 6.

Earthquakes in Syria, Oct. 13.

The king of Pruſſia defeats the Auſtrians at Torgau, Nov. 3.

Pondicherry taken by Col. Coote, Jan. 15.

Belleiſle ſurrendered to the Britiſh, Feb. 4.

1762 War declared againſt Spain.

Peter III. emperor of Ruſſia, is depoſed, impriſoned, and murdered.

American philoſophical ſociety eſtabliſhed in Philadelphia.

George Auguſtus Frederic, prince of Wales, born, Aug. 12.

Martinico ſurrendered to the Britiſh, Feb. 4.

Havannah ſurrendered to ditto, Aug. 12.

Manilla taken by ditto, Oct. 6.

1763 The definitive treaty of peace between Great Britain, France, Spain, and Portugal, concluded at Paris, February 10th; which confirms to Great Britain the extenſive province of Canada, Eaſt and Weſt Florida, and part of Louiſiana, in North America; alſo the iſlands of Grenada, St Vincent, Dominica, and Tobago, in the Weſt Indies.

The Jeſuits expelled from France.

1764 The parliament granted 10,000l. to Mr Harriſon for his diſcovery of the longitude by his time-piece.

Famine and peſtilence in Italy.

An earthquake at Liſbon.

1765 His majeſty's royal charter paſſed for incorporating the ſociety of artiſts.

An act paſſed annexing the ſovereignty of the iſland of Man to the crown of Great Britain.

1766 April 21ſt, a ſpot or macula of the ſun, more than thrice the bigneſs of our earth, paſſed the ſun's centre.

The American ſtamp act repealed, March 18.

A great earthquake at Conſtantinople.

The Jeſuits expelled from Bohemia and Denmark.

1767 The Jeſuits expelled from Spain, Venice, and Genoa, April 2d.

Martinico almoſt deſtroyed by an earthquake.

The Proteſtants tolerated in Poland, Nov. 2d.

1768 Academy of painting eſtabliſhed in London.

The Turks impriſon the Ruſſian ambaſſador, and declare war againſt that empire.

The Jeſuits expelled from Naples, Malta, and Parma.

1769 Paoli fled from Corſica, June 13. The iſland then reduced by the French.

1770 An earthquake at St Domingo.

1771 Dr Solander and Mr Banks, in his majeſty's ſhip the Endeavour, Lieut. Cook, return from a voyage round the world, having made ſeveral important diſcoveries in the South ſeas.

An emigration of 500,000 Tourgouths from the coaſts of the Caſpian ſea to the frontiers of China.

1772 The king of Sweden changes the conſtitution from ariſtocracy to a limited monarchy.

The Pretender marries a princeſs of Germany, grand daughter of Thomas late earl of Ayleſbury.

The emperor of Germany, empreſs of Ruſſia, and the king of Pruſſia, ſtrip the king of Poland of a great part of his dominions, which they divide among themſelves, in violation of the moſt ſolemn treaties.

1773 Captain Phipps is ſent to explore the North Pole; but having made 81 degrees, is in danger of being locked up by the ice, and his attempt to diſcover a paſſage in that quarter proves fruitleſs.

The Engliſh Eaſt India Company having, by conqueſt or treaty, acquired the extenſive provinces of Bengal, Orixa, and Bahar, containing 15 millions of inhabitants, great irregularities are committed by their ſervants abroad; upon which government interferes, and ſends out judges, &c. for the better adminiſtration of juſtice.

The war between the Ruſſians and the Turks proves diſgraceful to the latter, who loſe the iſlands in the Archipelago, and by ſea are everywhere unſucceſsful.

The ſociety of Jeſuits ſuppreſſed by the pope's bull, Aug. 25.

1774 Peace is proclaimed between the Ruſſians and the Turks.

The Britiſh parliament having paſſed an act laying a duty of 3d. per pound upon all teas imported into America, the coloniſts, conſidering this as a grievance, deny the right of the Britiſh parliament to tax them.

The American colonies ſend deputies to Philadelphia, who aſſume the title of *The Congreſs of the Thirteen United Provinces*, and all the powers of government.

1775 The American war commences. Action at Bunker's Hill, June 7.

The Spaniards land near Algiers, and are defeated, July 8.

1776 The congreſs declare the United States of America independent of the crown and parliament of Great Britain.

The Americans received a dreadful defeat at Long Iſland, Aug. 27.

1777 Philadelphia taken by the Britiſh, Oct. 3.

General Burgoyne with his army ſurrenders to the Americans.

1778 A moſt extraordinary eruption of Veſuvius, Auguſt 8.

The ſiege of Gibraltar begun by the Spaniards, July 8.

1780

1780 Jan. 14th, 6h. A. M. the thermometer ſuſpended in the open air at Glaſgow, ſtood at 46° below 0.
The Spaniſh fleet defeated by Admiral Rodney, Jan. 16th.
Charleſtown ſurrendered to the Britiſh, May 12th.
A dreadful inſurrection in London, and riots in many other places of the kingdom.
A great number of Britiſh ſhips taken by the combined fleets of France and Spain.
Lord Cornwallis defeats the Americans at Camden.
A dreadful hurricane in the Leeward Iſlands, Oct. 9th.
An extraordinary ſtorm of wind in England.
War declared againſt the Dutch, Dec. 20th.
1781 A terrible engagement between the Dutch and Britiſh fleets near the Dogger Bank, Auguſt 5th.
Lord Cornwallis with his army ſurrenders to the united forces of France and America, Oct. 18th.
1782 Minorca ſurrendered to the Spaniards, February 4th.
The French fleet under De Graſſe defeated and almoſt deſtroyed by Admiral Rodney, April 12th.
The Spaniſh floating batteries before Gibraltar entirely deſtroyed, Sept. 12.
1783 Preliminaries of a general peace ſigned. America declared independent, Jan. 20th.
A dreadful earthquake, attended with many extraordinary circumſtances, in Italy and Sicily.
The ſun obſcured by a kind of fog during the whole ſummer.
A volcanic eruption in Iceland ſurpaſſing any thing recorded in hiſtory. The lava ſpouted up in three places to the height of two miles perpendicular, and continued thus for two months; during which time it covered a tract of 3600 ſquare miles of ground, in ſome places more than 100 feet deep.
A large meteor appears to the northward of Shetland, and takes its direction ſouthward, with a velocity little inferior to that of the earth in its annual courſe round the ſun. Its track obſerved for more than 1000 miles.
Algiers bombarded by the Spaniards.
A great tumult at Philadelphia between the inhabitants and French ſoldiery.
An extraordinary aurora borealis ſeen at London.
Bednore taken by the Engliſh.
Magazine at Bencoolen blown up.
Bottles made of the lava of volcanoes.
Byrne, the Iriſh giant, eight feet four inches, dies by intemperance.
Famine in the Carnatic.
Charles Guſtavus prince of Sweden dies.
A father kills three of his children with the thigh-bone of a horſe, after hearing a ſermon on the happineſs of thoſe who die young.
Sir Eyre Coote defeats Hyder Ally.
Cremnitz in Hungary deſtroyed by lightning.
1783 Dartmouth Eaſt Indiaman loſt.
Definitive treaties between Britain and France, Spain and America, concluded.
The Eaſt India houſe robbed.
Thanks to General Elliot voted by the houſe of commons.
Embargo on ſalt in Ireland taken off.
A foreſt in Poland ſuddenly diſappears.
Iſland of Formoſa deſtroyed by an earthquake.
Gold and ſilver lace prohibited in Denmark.
A conſpiracy againſt the Grand Signior diſcovered.
Groſvenor Indiaman loſt.
Mangalore ſurrenders to the Britiſh.
Five meteors or fire-balls ſeen at different places in England.
Serious mutinies at Portſmouth, Jerſey, Guernſey, Dublin, &c.
A plague breaks out at Conſtantinople.
Powder mills at Ewell blown up.
A man in Moſcow has 84 children alive out of 87 by three wives.
Queen Charlotte delivered of a princeſs.
1784 General Cornwallis made conſtable of the Tower.
Sluices at Lillo opened by the Dutch.
Great earthquakes in Iceland, Grenoble, &c.
Fort Frederick at Grenada blown up.
Commodore Lindſay viſited by the king and queen of Naples.
Pennſylvania in extreme diſtreſs.
A general thankſgiving for peace with America, &c.
Allan Ramſay, Eſq. ſon of the celebrated poet of the ſame name, dies at Dover.
St Auguſtine in Florida declared a free port.
A gang of deſperate robbers apprehended at Glaſgow.
A volcano diſcovered in the moon.
1785 Melancholy fate of two aëronauts.
A ſingular calamity at Barbadoes, by the ſinking of the ſurface in different places.
A new comet diſcovered.
The queen of France is delivered of a ſon.
A remarkable accident happens in the court of king's bench.
A dreadful inundation happens at Vienna in Germany.
1786 The Halſewell Eaſt Indiaman ſtruck on the rocks of Purbeck, and about 100 of the crew periſhed, Jan. 6th.
Joiner's works performed by a blind man in ſuch a maſterly manner as to aſtoniſh the ableſt judges, at Hermanſtadt in Tranſilvania.
The king of Pruſſia makes a handſome proviſion during life for the widow and children of Colonel Vantroſcke, a deſerving officer. April.
The weſt tower of Hereford church, 125 feet high, built in the 12th century, fell down on the evening of 17th April, but no people then in the church-yard received any injury.
M. Blanchard aſcends in a balloon 96 miles in as many minutes. Writes a letter in the air, dated April 18th, to the editors of the Paris Journal.

1786 To the number of 6398 boys and girls clothed, educated, and ſupported by voluntary contributions, aſſemble under the dome of St Paul's cathedral.

A ſmall prayer-book compoſed by Queen Elizabeth, and in her own hand-writing, ſold in London for 100 guineas, June 7th.

The prince of Wales orders his whole ſtud to be diſpoſed of by auction, to enable him to liquidate his debts.

1787 The king of Pruſſia eſtabliſhes a court of honour for the purpoſe of ſuppreſſing duelling.

A meeting of notables convened by the king of France for reforming abuſes relating to the ſubject of finance, January 10th.

Two ſhips ſailed from Graveſend with black people on board, for a new ſettlement at Sierra Leone, January 9th.

The king of Poland has an interview with her imperial majeſty at Kiow, March 7th.

Nine ſhips ſailed for Botany Bay from Spithead with convicts, 21ſt.

A motion in parliament for repealing the teſt and corporation acts, 28th.

M. de Calonne is diſmiſſed from office, April 10th.

Mr Haſtings impeached at the bar of the houſe of lords, May 10th.

——— petitions to be admitted to bail, 22d.

The ſum of 161,000l. voted for the liquidation of the Prince of Wales's debts, 24th.

The Hartwell Eaſt Indiaman loſt off the iſland of Bona Viſta, 24th.

Two ſatellites belonging to Georgium Sidus diſcovered by Dr Herſchel, June 7th.

The Ruſſian ambaſſador at Conſtantinople impriſoned, Auguſt 16th.

The Pruſſian troops under the duke of Brunſwick take poſſeſſion of Utrecht, Sept. 17th.

Twenty-three ſail of the line put into commiſſion, and ſeventeen new admirals appointed, Sept. 24th.

The Pruſſians gain poſſeſſion of Amſterdam, October 11th.

A moſt remarkable aurora borealis appears, 13th.

Lord George Gordon apprehended, and committed to Newgate, December 7th.

1788 Died at Bryngwyn in Radnorſhire ſix perſons during the month of January, whoſe united ages made up 644 years.

A new copper coinage of halfpence begins to circulate in Britain, July 19th.

William Brodie and George Smith tried for breaking into the general exciſe office for Scotland, and ſentenced to be executed, September 1ſt.

A dreadful hurricane at Martinico laid many pariſhes waſte, and deprived multitudes of their exiſtence, Auguſt 14th.

The king of France aboliſhed the torture, and ordained that every accuſed perſon ſhall have counſel immediately aſſigned him, October 18th. He ordered alſo, that a majority of one may acquit the accuſed, while three are required to condemn.

An iron barge built by John Wilkiſon, Eſq. at Wilby wharf Shrewſbury, was launched, drawing only eight inches water, and moving very eaſily on that element, November 7th.

His Britannic majeſty is ſeized with a ſevere indiſpoſition, October 17th.

A new comet in the conſtellation of Urſa Major, diſcovered by M. Meſſier aſtronomer at Paris, November 26th.

1789 Coins bearing date 1057 were found beneath the foundation of the old markethouſe at Farnham.

Another ſatellite diſcovered by Dr Herſchel belonging to Saturn.

Earthquake at Comrie, November 3d.

Foundation ſtone of that magnificent ſtructure, the univerſity of Edinburgh, laid by the Right Honourable Francis Lord Napier, grand maſter-maſon of Scotland, November 16th.

Phipps (father and ſon) hanged for forgery, September 5th.

Revolution of France is begun and gradually advanced.

General Waſhington makes a ſplendid entrance into the city of Philadelphia, where a ſumptuous entertainment is provided for him by the joyful citizens, April 22d.

An excellent and cheap dye invented in Germany.

Dr Withers ſentenced to 12 month's impriſonment, to pay a fine of 50l. and to find ſecurity for five years, himſelf in 500l. and two others in 250l. each, for defaming the character of Mrs Fitzherbert, November 21ſt.

The ſum of 261l. 3s. voted to Brook Watſon, Eſq. to defray the expences of a new invented method of cultivating hemp, December 14th.

1790 Exile of the Duke de Orleans.

Bed of juſtice inſtituted in France.

Calamitous ſtate of affairs in that country.

The archbiſhop of Toulouſe diſmiſſed from office.

A convention ſigned at the Eſcurial between his Britannic majeſty and the king of Spain, October 28th.

A memorial of the court of Spain delivered to Mr Fitzherbert, June 13th.

M. Montmorin's letter to the national aſſembly of France.

Louis XVI. delivers a ſpeech to the national aſſembly.

A blackbird's neſt with four eggs found December 25th, near Nuneham in Oxfordſhire.

1791 Serious riots at Paris.

The Tiers Etat conſtitute themſelves a national aſſembly.

Paris is ſurrounded by the military at the deſire of the king.

Priſons ſet open by the mob, and a great famine in Paris, whether real or artificial is involved in obſcurity.

M. Necker is diſmiſſed from office, and the Baſtile demoliſhed.

M. La Fayette appointed commander in chief of the national guard.

M. Necker is recalled with every demonſtration of joy.

1791 A moſt horrid inſurrection takes place on the 5th of October.

The royal family comes from Verſailles to Paris.

The abolition of orders decreed by the aſſembly.

The iſland of Corſica united to France.

The unpopular and oppreſſive tax on ſalt aboliſhed.

M. Necker again reſigns, about which time a riot breaks out at Paris, and a ſerious mutiny in the harbour of Breſt.

Foreign powers combine againſt France.

The king of France flies, is apprehended, and returns.

The city of Paris put under martial law.

The Netherlands revolt from Germany.

Peace is concluded between Auſtria and Pruſſia, and between Pruſſia and Sweden.

The grand vizier is diſgraced, and dies.

A peace concluded between Ruſſia and Conſtantinople.

A convention is entered into with Spain relative to Nootka Sound.

War carried on in India with Tippoo Saib.

The Britiſh parliament is diſſolved, and the new parliament is ſoon after opened by a ſpeech from the throne.

A bill is preſented in the Britiſh parliament for the relief of Proteſtant Catholics.

The French conſtitution ſettled by the aſſembly, and preſented to the king, September 3d.

Accepted of by the king, 13th.

1792 Waſhington's ſpeech to both houſes of congreſs, October 25th.

A treaty between Britain and Pruſſia relative to the marriage of the duke of York with Frederica Charlotte.

Guſtavus III. of Sweden is aſſaſſinated by Ankarſtrom.

General Dillon is inhumanly murdered by his own ſoldiers.

M. Rochambeau reſigns the command of the French army in the north, and is ſucceeded by M. Luckner.

Horrible outrages are committed in Paris on the 20th June.

The French arms are victorious in the Netherlands.

A petition is preſented to the aſſembly, praying for the depoſition of Louis XVI.

The palace is abandoned by the royal family of France, and attacked by the federates, at which time the Swiſs guards are maſſacred.

Louis is depoſed, and he and his family impriſoned.

War proclaimed by the aſſembly of France againſt the king of Hungary and Bohemia, April 20th.

The king of the French writes a confidential letter to the king of Great Britain.

A manifeſto againſt the French revolution by the emperor of Germany and the king of Pruſſia.

The French national aſſembly proceeds to the trial of the king. He is condemned and executed, Jan. 21. after which M. Chauvelin is diſmiſſed from London.

Dumourier arreſts the commiſſioners ſent to bring him to the bar of the convention, and ſends them as priſoners to the Auſtrians. He finally abandons the cauſe of France as hopeleſs and deſperate. He is ſucceeded by General Dampier.

The Briſſotine party is denounced by the people of Paris.

Marat is committed to the Abbey, but ſoon releaſed, and aſſaſſinated at laſt by a female from Normandy.

An expedition is undertaken againſt Dunkirk, which is rendered abortive.

General Cuſtine, the queen, the deputies of the Gironde, Manuel, Houchard, Bailly, Barnave, Rabaut, the duke of Orleans and Madame Roland, are condemned and executed.

Earl Moira makes an unſuccceſsful deſcent on the coaſt of France.

Toulon ſurrenders to the Britiſh, but is retaken by the French.

1794 Earl Stanhope moves that the French republic be acknowledged by Britain.

Mr Adam propoſes to amend the criminal law of Scotland, which gives riſe to intereſting debates.

The firſt reading of a bill for ſuſpending the Habeas Corpus act is proteſted againſt, May 22.

Proteſt againſt the vote of thanks to Lord Hood, June 17.

The king of Pruſſia withdraws from the coalition.

A bill is brought into parliament for the abolition of the ſlave-trade, and rejected by the lords.

General Fitzpatrick moves for an inquiry into the reaſons of M. la Fayette's impriſonment.

A motion for peace with France is made by the duke of Bedford and Mr Fox.

Thanks are voted by both houſes to Lord Howe, Sir Charles Grey, and Sir John Jervis.

That valuable inſtrument the *telegraph* is invented by the French.

The bold eloquence of Billaud Varennes, and Tallien, opens the eyes of France reſpecting the ambitious views of that ſanguinary monſter Maximilian Robeſpierre, who is condemned and executed (28th June), with about 20 of his diabolical coadjutors.

General Clairfait is defeated, and Louvain and Namur are taken by the French.

A treaty is entered into between Sweden and Denmark, and neutral powers oblige Britain to indemnify them for their loſſes.

1795 La Pique of 38 guns captured by Vice-admiral Caldwell, Jan. 4.

Admiral Hotham captures two French ſhips, Ca-ira of 80, and the Cenſeur of 74 guns, March 16.

Warren Haſtings acquitted of the ſerious charges preferred againſt him by a majority of the houſe of peers, April 25.

The Boyne of 98 guns is blown up at Spithead, but not ſo much damage done to adjacent veſſels as there was reaſon to dread, all her guns being loaded, May 4.

Captain Anthony James Pye Molloy diſmiſſed from the command of the Cæſar of 74 guns, for neglect of duty.

Some ſhips of war belonging to the French taken by the fleet under the command of Admiral Bridport, 23d June.

Leopold brother to the emperor of Germany died Auguſt 10.

La Minerve of 42 guns captured by Captain Towry, June 24.

The beautiful church of St Paul's, Covent-garden, totally conſumed by fire, Sept. 19.

A ſhock of an earthquake felt through moſt of the town of Birmingham, Nov. 23.

1796 A ſtone was thrown at his Britannic majeſty's carriage on his way from Pall-mall to Buckingham-houſe, which broke a window and greatly alarmed Lady Harrington, Feb. 1. A reward of 1000l. was offered for the apprehenſion of the criminal, but without effect.

Admiral Cornwallis is tried on board the Orion, for acting contrary to orders received from the admiralty, and acquitted, April 17.

Sir Sidney Smith taken by the French at Havre, April.

L'Unité, a French frigate of 38 guns, taken by Captain Cole, and La Virginie of 44 by Sir Edward Pellew, April 13. and 20.

Croſsfield for attempting to aſſaſſinate his majeſty, was tried and acquitted, May 20.

Les Trois Coleurs of 10, and La Blonde of 16 guns, captured by Sir Edward Pellew, May 18.; and La Tribune of 44 guns by Captain Martin, ſame month.

Two houſes fell down in Clare-market, in the ruins of which 17 perſons were unfortunately buried, June 27.

The Amphion frigate of 32 guns blown up at Plymouth, when about 260 lives were loſt, Sept. 22.

The empreſs Catharine II. of Ruſſia died at her palace of an apoplectic fit, Nov. 17.

1797 Part of a French fleet came to anchor in Bantry bay, having on board an army of 25,000 men, under the command of General Hoche; but afterwards weighed and ſtood out to ſea, January 2.

The ſteeple of a church near Norwich fell down while the bell was ringing for public worſhip, Jan. 8.

La Muſette of 22, and Deux Amis of 14 guns, captured by the Britiſh and ſent into Cork, Jan. 14.

The city of Savannah nearly conſumed to aſhes by fire.

Sir John Jervis, with a fleet of 15 ſail, engages a Spaniſh fleet of 27 ſail of the line, which he defeats, taking the Salvador del Mundo and San Joſef of 112 guns each; the San Nicolas of 80 and San Yſidro of 74 guns, February 14.

The iſland of Trinidad ſurrenders to the Britiſh forces under the command of Sir Ralph Abercrombie.

Alarming ſymptoms of a mutiny appear among the ſeamen of the Britiſh fleet, May 7.

The nuptial ceremonies are ſolemnized between the prince of Wirtemberg Stutgard and Charlotte Auguſta Matilda, eldeſt daughter of his Britannic majeſty George III. May 18.

Lord Malmſbury appointed miniſter plenipotentiary from the court of Britain to France for negociating a treaty of peace, July 1.

About 30 French war veſſels of different dimenſions taken or deſtroyed by the ſquadron under Sir J. B. Warren, between 17th July and 6th of September

A deſperate engagement off Camperdown between Admirals Duncan and De Winter, when the latter is totally defeated by the former, with the loſs of 11 ſhips.

1798 Le Duguay Trouin, a French privateer, captured by Captain Frazer of his majeſty's ſhip Shannon, Feb. 3.

A powder-mill belonging to Mr Harvey is blown up, which demoliſhes ſeveral adjacent buildings, and kills three of the workmen, April 25.

L'Hercule, a French ſhip of 74 guns, captured by the Mars, April 21.

Rebels in the Curragh of Kildare, Ireland, lay down their arms, May 29.

Wexford rebels defeated with great loſs and ſlaughter, June 10.

Propoſals of the Iriſh rebels rejected by General Lake, June 22.

The Princeſs Amelia Eaſt Indiaman accidentally burnt on the coaſt of Malabar, and 40 of her crew periſhed, April 5.

An engagement at Caſtlebar between General Lake and a party of French landed in Ireland, Auguſt 27.

A dreadful engagement between the Britiſh fleet under the command of Sir Horatio Nelſon, and the French fleet commanded by Admiral Bruys, off the mouth of the Nile, when nine ſail of the line belonging to the French were taken, three burnt, one ſunk, and four eſcaped, Aug. 1.

The yellow-fever, which carried off 3000 people in New-York, in a few months, happily ceaſed to rage, Nov. 15.

1799 A dreadful ſhock of an earthquake was felt at Guernſey on the night of the 6th.

A deſperate battle fought between the Archduke Charles and General Jourdon at Stockaſh, March 25.

La Vigie of 14, and Anacreon privateer of 16 guns, taken by his Britannic majeſty's ſhip Champion, Captain Graham commander, July 2.

Three frigates captured by the Centaur, J. Wood commander, June 19.

Mantua ſurrenders to the Auſtrians, June 30.

The Britiſh forces deſtined to invade Holland begin to diſembark, 27th Auguſt.

Seven ſhips of war, and 13 Indiamen and tranſports, taken in the Nieuve Diep by Admiral Mitchell, Auguſt 27.

Seringapatam ſurrenders to the Britiſh forces, when Tippoo Sultan is ſlain, 4th May.

A Spaniſh frigate called Thetis, with a valuable cargo on board, ſurrenders to Captain Young of the Ethalion, 16th October.

Britiſh and Ruſſian forces obliged to evacuate Holland, November.

La Furet of 14 guns ſtrikes to the Viper cutter, Lieutenant Pengelly commander, 26th December.

1800 Three French privateers and one Spaniſh captured by the Ariſtocrat, Lieutenant Wray, January.

A French letter of marque with 12 four pounders and 30 men taken by a Britiſh long boat.

His Britannic majeſty's ſhip Repulſe of 64 guns loſt, and a number of the crew periſhed, 9th March.

A convention between the ambaſſadors of the Ottoman Porte and General Deſaix, ſigned at El Ariſch, 24th January, by which the French troops were permitted to return to their own country.

His Britannic majeſty's ſhip Danae carried into Breſt by the mutineers on board, 27th March.

Genereux of 74 guns captured by the Northumberland and Foudroyant, February 18.

A French privateer of 22 guns captured by the Amethyſt, Captain Cook commander, 31ſt March.

His Britannic majeſty ſhot at in the theatre, May 16th, by a maniac of the name of Hadfield.

The queen Charlotte of 100 guns is burnt off Leghorn, and the gallant crew periſh, 17th March.

The French ſhip of war Guillaume Tell of 86 guns and 1000 men ſurrenders to the Lion, Penelope, and Foudroyant, March 30.

Le Cerhere of ſeven guns and 87 men taken by a boat's crew of 20 men, commanded by Lieutenant Coghlan.

A number of veſſels with valuable cargoes captured by La Girone French privateer, Auguſt.

Unſucceſsful expedition againſt Ferrol, Auguſt.

The French garriſon of La Valette ſurrendered to the allied forces at Malta, 4th September.

His Britannic majeſty's ſhip Marlborough of 74 guns, was completely wrecked off Belleiſle, 4th November.

La Venus of 32 guns captured by the Indefatigable and Fiſgard, October 24.

A moſt dreadful ſtorm at London, which unroofed many houſes, blew down others, tore up numbers of trees by the roots, and by the effects of which ſome lives were loſt, 9th November.

1801 An embargo laid on all Ruſſian, Daniſh, and Swediſh veſſels in the ports of Great Britain, 14th January.

The united parliament of Great Britain and Ireland met for the firſt time, January 22.

The Invincible of 74 guns ran aground on the coaſt of Norfolk, and was totally loſt, when about 400 ſouls periſhed, March.

A dreadful engagement off Copenhagen, between the Daniſh line, and the Britiſh fleet under Admiral Parker; in which 943 of the Britiſh were killed and wounded, April 2.

Aboukir ſurrenders to the Britiſh under the command of Sir Ralph Abercrombie, who received a mortal wound on the 21ſt March, of which that great officer died on the 28th.

The French attacked at Rahmanieh, compelled to retreat towards Cairo, and purſued by General Hutchinſon, March 9.

General Hutchinſon takes 550 camels, and 600 French priſoners.

In an engagement between a French and Britiſh ſquadron in the bay of Algeziras, the Hanibal unfortunately fell into the hands of the enemy by taking the ground. The Britiſh ſquadron rendered uſeleſs, two of 84, one of 74 guns, and a large frigate, July 5.

A ceſſation of arms by ſea and land between Britain and the French republic, reſulting from the ſigning of preliminaries of peace by Lord Hawkeſbury and M. Otto, October 1.

Alexandria ſurrenders to General Hutchinſon on the 2d September.

The Swiftſure captured by Admiral Gantheaume, who treated the crew with the utmoſt humanity and tenderneſs.

1802 Joſeph Wall, governor of the iſland of Goree in 1782, was executed for ordering a ſerjeant to receive 800 laſhes, of which he died, January 28.

Mr Moore arrived with the definitive treaty of peace ſigned at Amiens on the 27th March, at four in the afternoon.

The flour mills at Bromley, the property of Meſſrs Metcalf and company, were burnt to the ground, April 8.

A dreadful fire broke out (May 13.) in the town of Bedford, which deſtroyed 72 houſes, and deprived about 700 perſons of their all.

Intercourſe forbidden at Wilmington, Delaware, September 5. with Philadelphia and New York, on account of the yellow fever.

A deciſion obliging bookſellers to publiſh no books without the name of the printer at the beginning and end of them, was ratified, 20th October.

General Andreoſi, as ambaſſador from France, arrived at Calais 3d of November, where he was received with diſcharges of artillery. Has an audience of his Britannic majeſty, 17th.

Lord Whitworth preſented to Bonaparte his letters of credence as miniſter plenipotentiary from his Britannic majeſty, December 5.

1803 A ſerious rebellion ſuppreſſed in China, occaſioned by the efforts of Ong Fong, a daring chief, at the head of 50,000 men.

One of the queens of the Rajah at Tanjore burns herſelf on the funeral pile of her deceaſed huſband, in ſpite of the tears and intreaties of all her relations.

1804 Active meaſures taken in Dublin to ſecure the country againſt invaſion.

A ſhip of 1200 tons caſt aſhore.

Admiral Story with two captains declared diſgraced, perjured, and infamous, degraded from their poſts, and baniſhed the republic, not to return on the pain of death, January 16.

A ſplendid meteor ſeen at Perth, February 7.

Duke D'Enghien and other emigrants ſeized, ſent to France, and executed, March 15.

The French fleet under Admirals Linois engaged and purſued by a fleet of Eaſt Indiamen, commanded by Captain Dance.

CHRONOMETER, in general, denotes any inſtrument or machine uſed in meaſuring time; ſuch are dials, clocks, watches, &c. See Dial, &c.

The term *chronometer*, however, is generally uſed in a more limited ſenſe, for a kind of clock ſo contrived as to meaſure a ſmall portion of time with great exactneſs, even to the ſixteenth part of a ſecond; of ſuch a one there is a deſcription in Deſagulier's experimental philoſophy, invented by the late ingenious Mr George Graham; which muſt be allowed to be of great uſe for meaſuring ſmall portions of time in aſtronomical obſervations, the time of the fall of bodies, the velocity of running waters, &c. But long ſpaces of time cannot be meaſured by it with ſufficient exactneſs, unleſs its pendulum be made to vibrate in a cycloid; becauſe otherwiſe it is liable to err conſiderably, as all clocks are which have ſhort pendulums that ſwing in large arches of a circle.

There have been ſeveral machines contrived for meaſuring time, under the name of *chronometers*, upon principles very different from thoſe on which clocks and watches are conſtructed.

Plate CXXXVII. Vol. V. fig. 1. repreſents an air-chronometer, which is conſtructed in the following manner: Provide a glaſs tube of about an inch in diameter, and three or four feet long: the diameter of the inſide of this tube muſt be preciſely equal in every part: at the bottom muſt be a ſmall hole, cloſely covered with a valve. In the tube place a piſton, E. fig. 2. which is made to fit it exactly, and muſt be oiled, that it may move in the tube with the greateſt freedom; in this piſton there is a cock that ſhuts quite cloſe; and from the top of it there goes a cord F, which paſſes through the handle G. The cock of the piſton being cloſed, it is to be let down to the bottom of the tube, and being then drawn up to the top, the air will then ruſh in by the valve at the bottom of the tube, and ſupport the piſton. You are then to turn the cock, ſo as to make a very ſmall vent; and the air paſſing ſlowly through that vent, the piſton will gradually deſcend and ſhow the hour, either by lines cut in the tube with a diamond, or marked with paint, or by ſmall ſlips of paper painted on the glaſs. If this chronometer ſhould go too faſt or too ſlow, it may be eaſily regulated by altering the poſition of the cock in the piſton, as it is on that the whole depends.

If, inſtead of marking the tube, you would have the time ſhown by a dial, it may be eaſily effected by placing an axis, to which the hand of the dial is fixed, directly over the tube, and winding the ſtring to which the piſton is joined round that axis; for then as the piſton deſcends, the axis will gradually turn the hand, and ſhow the hour; but it muſt be obſerved, that as the deſcent of the piſton is not conſtantly regular, on account of the decreaſe of reſiſtance from the quantity of the ſubjacent air as the piſton deſcends, the axis therefore muſt not be a regular cylinder, but conical like the fuſee of a watch, as in fig. 3. by which means the motion of the hand of the dial will be conſtant and regular.

Fig. 4. repreſents a lamp-chronometer. It conſiſts of a chamber lamp A, which is a cylindrical veſſel about three inches high, and one inch diameter, placed in the ſtand B. The inſide of this veſſel muſt be everywhere exactly of the ſame diameter. To the ſtand B is fixed the handle C, which ſupports the frame DEFG, about 12 inches high, and four wide. This frame is to be covered with oiled paper, and divided into twelve equal parts by horizontal lines; at the end of which are wrote the numbers for the hours, from 1 to 12, and between the horizontal lines are diagonals that are divided into halves, quarters, &c. On the handle B, and cloſe to the glaſs, is fixed the ſtyle or gnomon H. Now, as the diſtance of the ſtyle from the flame of the lamp is only half an inch, if the diſtance of the frame from the ſtyle is only ſix inches, then, while the float that contains the light deſcends by the decreaſe of the oil one inch, the ſhadow of the ſtyle on the frame will aſcend twelve inches, that is, its whole length, and ſhow by its progreſſion the regular increaſe of the hours, with their ſeveral diviſions. It is abſolutely neceſſary, however, that the oil uſed in this lamp be always of the ſame ſort and quite pure, and that the wick alſo be conſtantly of the ſame ſize and ſubſtance, as it is on theſe circumſtances, and the uniform figure of the veſſel, that the regular progreſs of the ſhadow depends.

Chronometer, among muſicians, an inſtrument invented by *Loulie*, a French muſician, for the purpoſe of meaſuring time by means of a pendulum. The form of the inſtrument, as deſcribed by him, is that of an Ionic pilaſter, and is thus deſcribed by Malcolm in his Treatiſe of Muſic, p. 407.—“ The chronometer conſiſts of a large ruler or board, ſix feet or 72 inches long, to be ſet on end; it is divided into its inches, and the numbers ſet ſo as to count upwards; and at every diviſion there is a ſmall round hole through whoſe centre the line of diviſion runs. At the top of this ruler, about an inch above the diviſion 72, and perpendicular to the ruler, is inſerted a ſmall piece of wood, in the upper ſide of which there is a groove, hollowed along from the end that ſtands out to that which is fixed in the ruler, and near each end of it a hole is made: through theſe holes a pendulum cord is drawn, which runs in the groove: at that end of the cord which comes through the hole furtheſt from the ruler, the ball is hung: and at the other end there is a ſmall wooden pin, which can be put in any of the holes of the ruler: when the pin is in the uppermoſt hole at 72, then the pendulum from the top to the centre of the ball muſt be exactly 72 inches; and therefore, whatever hole of the ruler it is put in, the pendulum will be juſt ſo many inches as that figure at the hole denotes. The manner of uſing the machine is this: The compoſer lengthens or ſhortens his pendulum, till one vibration be equal to the deſigned length of his bar, and then the pin ſtands at a certain diviſion, which marks the length of the pendulum; and this number being ſet with the cliff at the beginning of the ſong, is a direction for others how to uſe the chronometer in meaſuring the time according to the compoſer's deſign: for with the number is ſet the note, crotchet, or minim, whoſe value he would have the vibration to be; which in briſk duple time is beſt, a minim or half bar; or even a whole bar, when that is but a minim; and in ſlow time a crotchet. In triple time, it would do well to be the third part or half, or fourth part of a bar; and in the ſimple triples that are allegro, let it be a whole bar. And if, in every time that is allegro, the vibration is applied to a whole or half bar, practice will teach us to ſubdivide it juſtly and equally. Obſerve, that, to make this machine of univerſal uſe, ſome canonical meaſure of the diviſions muſt be agreed upon, that the figure may give a certain direction for the length of the pendulum.

CHROSTASIMA, in *Natural Hiſtory*, a genus of pellucid gems, comprehending all thoſe which appear of one ſimple and permanent colour in all lights; ſuch are the diamond, carbuncle, ruby, garnet, amethyſt, ſapphire, beryl, emerald, and the topaz. See DIAMOND, CARBUNCLE, &c.

CHRYSA, in *Ancient Geography*, a town of Myſia, on the ſinus Adramyttenus; extinct in Pliny's time: it had a temple of Apollo Smintheus, (Homer, Strabo). The country of the fair Chryſeis, who gave firſt riſe to the quarrel between Agamemnon and Achilles.

CHRYSALIS, or AURELIA, in *Natural Hiſtory*, a ſtate of reſt and ſeeming inſenſibility, which butterflies, moths, and ſeveral other kinds of inſects, muſt paſs through, before they arrive at their winged or moſt perfect ſtate.

In this ſtate, no creatures afford ſo beautiful a variety as the butterfly kinds, and they all paſs through this middle ſtate without one exception. The figure of the aurelia or chryſalis generally approaches to that of a cone; or at leaſt the hinder part of it is in this ſhape; and the creature, while in this ſtate, ſeems to have neither legs nor wings, nor to have any power of walking. It ſeems indeed to have hardly ſo much as life. It takes no nouriſhment in this ſtate, nor has it any organs for taking any; and indeed its poſterior part is all that ſeems animated, this having a power of giving itſelf ſome motions. The external covering of the chryſalis is cartilaginous, and conſiderably large, and is uſually ſmooth and gloſſy: but ſome few of them have a few hairs; ſome are alſo as hairy as the caterpillars from which they are produced; and others are rough, and, as it were, ſhagreened all over.

In all theſe there may be diſtinguiſhed two ſides; the one of which is the back, the other the belly, of the animal. On the anterior part of the latter, there may always be diſtinguiſhed certain little elevations running in ridges, and reſembling the fillets wound about mummies: the part whence theſe have their origin, is eſteemed the head of the animal. The other ſide, or back, is ſmooth, and of a rounded figure in moſt of the chryſaliſes; but ſome have ridges on the anterior part, and ſides of this part; and theſe uſually terminate in a point, and make an angular appearance on the chryſalis.

From this difference is drawn the firſt general diſtinction of theſe bodies. They are by this divided into two claſſes; the round and the angular kinds. The firſt are, by the French naturaliſts, called *feves*; from the common cuſtom of calling the chryſalis of the ſilk-worm, which is round, by this name.

There is ſomething more regular in this diſtinction than might at firſt be conceived; for the diviſion is continued from the fly-ſtate: the rounded chryſaliſes being almoſt all produced by the *phalenæ* or moths; and the angular ones by the *papilios*, or day-flies. There are ſeveral ſubordinate diſtinctions of theſe kinds; but, in general, they are leſs different from one another than the caterpillars from whence they are produced.

The head of thoſe of the firſt claſs uſually terminates itſelf by two angular parts, which ſtand ſeparate one from the other, and reſemble a pair of horns. On the back, eminences and marks are diſcovered, which imagination may form into eyes, noſe, chin, and other parts of the human face.

There is a great variety and a great deal of beauty in the figures and arrangement of the eminences and ſpots on the other parts of the body of the chryſaliſes of different kinds. It is a general obſervation, that thoſe chryſaliſes which are terminated by a ſingle horn, afford day-butterflies of the kind of thoſe which have buttoned antennæ, and whoſe wings, in a ſtate of reſt, cover the under part of their body, and which uſe all their ſix legs in walking, thoſe of many other kinds uſing only four of them. Thoſe chryſaliſes which are terminated by two angular bodies, and which are covered with a great number of ſpines, and have the figure of a human face on their back in the greateſt perfection, afford butterflies of the day kind; and of that claſs the characters of which are, their walking on four legs, and uſing the other two, that is, the anterior part, in the manner of arms or hands. The chryſaliſes which have two angular bodies on their heads, but ſhorter than thoſe of the preceding, and whoſe back ſhows but a faint ſketch of the human face, and which have fewer ſpines, and thoſe leſs ſharp, always turn to that ſort of butterfly, the upper wings of which are divided into ſegments, one of which is ſo long as to repreſent a tail, and whoſe under wings are folded over the upper part of the back. A careful obſervation will eſtabliſh many more rules of this kind, which are not ſo perfect as to be free from all exceptions; yet are of great uſe, as they teach us in general what ſort of fly we are to expect from the chryſalis, of which we know not the caterpillar, and therefore can only judge from appearances.

Theſe are the principal differences of the angular chryſaliſes; the round ones alſo have their different marks not leſs regular than thoſe.

The greater number of the round chryſaliſes have the hinder part of their body of the figure of a cone; but the upper end, which ought to be its circular plane baſe, is uſually bent and rounded into a ſort of knee; this is uſually called the head of the chryſalis; but there are alſo ſome of this kind, the head of which is terminated by a nearly plane ſurface: ſome of the creeping ten-legged caterpillars give chryſaliſes of this kind, which have each of them two eminences that ſeem to bring them towards the angular kind.

Among the angular chryſaliſes there are ſome whoſe colours ſeem as worthy our obſervation as the ſhapes of the others. Many of them appear ſuperbly clothed in gold. Theſe elegant ſpecies have obtained the name of *chryſalis* and *aurelia*, which are derived from Greek and Latin words, ſignifying gold; and from theſe all other bodies of the ſame kind have been called by the ſame names, though leſs, or not at all, entitled to them. As ſome kinds are thus gilded all over, ſo others are ornamented with this gay appearance in a more ſparing manner, having only a few ſpots of it in different places on their back and belly. Theſe obvious marks, however, are not to be depended upon as certain characters of diſtinction; for accidents in the formation of the chryſalis may alter them; and thoſe which naturally would have been gilded all over, may be ſometimes only ſo in part; and either theſe or the others may, by accident, be ſo formed, as to ſhow nothing of this kind at all, but be only of a duſky brown. Thoſe, however, which have neither ſilver nor gold to recommend them to your eyes, do not want other colours, and thoſe beautifully variegated. Some of them are all over of an elegant green, as in the chryſalis of the fennel caterpillar; others of an elegant yellow; and ſome of a bright greeniſh tinge, variegated with ſpots of a ſhining black; we have a very beautiful inſtance of this laſt kind in the chryſalis of the elegant cabbage-caterpillar. The general colour of the chryſalis of the common butterflies, however, is brown.

Some are alſo of a fine deep black; and of theſe many are ſo ſmooth and gloſſy, that they are equal to the fineſt Indian japan. The common caterpillar of the fig-tree gives an inſtance of one of theſe moſt beautiful gloſſy ones; the caterpillar of the vine affords another of theſe fine black chryſaliſes.

The rounded chryſaliſes do not afford any thing of that variety of colouring ſo remarkably beautiful in the angular ones; they are uſually of a duſky yellow, in different ſhades, and are often variouſly ſpotted with black; but theſe, as well as all other chryſaliſes, before they arrive at their fixed colour, paſs through ſeveral other temporary ones; ſome being of a different colour when firſt produced from the caterpillar, from what they are a few days afterwards; and ſome varying ſo greatly, though only in degree, as not to be diſtinguiſhable, even by the moſt converſant eye, from what they were when firſt produced. The green rough caterpillar of the cabbage has a chryſalis which is green at firſt; and from that gradually goes through all the ſhades of green to a faint yellow, which is its laſting colour; and one of the oak caterpillars yields a chryſalis beautifully ſpotted with red at its firſt appearance; but theſe ſpots change to brown for their fixed colour: the third day from their formation uſually fixes their laſting colours; and if they are obſerved to turn black in any part after this time, it is a ſign that they are dead or dying.

The ſeveral ſpecies of inſects, as a fly, ſpider, and an ant, do not differ more evidently from one another in regard to appearance, than do a caterpillar, its chryſalis, and a butterfly produced from it; yet it is certain, that theſe are all the product of the ſame individual egg; and nothing is more certain, than that the creature which was for a while a caterpillar, is, after a certain time, a chryſalis, and then a butterfly. Theſe great changes produced in ſo ſudden a manner, ſeem like the *metamorphoſes* recorded in the fables of the ancients; and indeed it is not improbable that thoſe fables firſt took their origin from ſuch changes.

The parts being diſtinguiſhable in the chryſalis, we eaſily find the difference of the ſpecies of the fly that is to proceed from it. The naked eye ſhows whether it be one of thoſe that have, or of thoſe that have not, a trunk; and the aſſiſtance of a microſcope ſhows the antennæ ſo diſtinctly, that we are able to diſcern whether it belongs to the day or night claſs; and often to what genus, if not the very ſpecies: nay, in the plumoſe horned kinds, we may ſee, by the antennæ, whether a male or female phalæna is to be produced from the chryſalis; the horns of the female being in this ſtate evidently narrower, and appearing leſs elevated above the common ſurface of the body, than thoſe of the male.

All theſe parts of the chryſalis, however, though ſeen very diſtinctly, are laid cloſe to one another, and ſeem to form only one maſs; each of them is covered with its own peculiar membrane in this ſtate, and all are ſurrounded together by a common one; and it is only through theſe that we ſee them; or rather we ſee on theſe the figures of all the parts moulded within, and therefore it requires attention to diſtinguiſh them. The chryſalis is ſoft when firſt produced, and is wetted on the front with a viſcous liquor; its ſkin, though very tender at firſt, dries and hardens by degrees; but this viſcous liquor, which ſurrounds the wings, legs, &c. hardens almoſt immediately; and in conſequence faſtens all thoſe limbs, &c. into a maſs, which were before looſe from one another: this liquor, as it hardens, loſes its tranſparence, and becomes brown; ſo that it is only while it is yet moiſt that theſe parts are to be ſeen diſtinct.

It is evident from the whole, that the chryſalis is no other than a butterfly, the parts of which are hid under certain membranes which faſten them together; and when the limbs are arrived at their due ſtrength, they become able to break through theſe membranes, and then expand and arrange themſelves in their proper order.

The firſt metamorphoſis, therefore, differs nothing from the ſecond, except that the butterfly comes from the body of the caterpillar in a weak ſtate, with limbs unable to perform their offices, whereas it comes from the chryſalis perfect.

Hiſt. of Inſects, vol. i. p. 2.—28.

M. Reaumur has given us many curious obſervations on the ſtructure and uſes of the ſeveral coverings that attend the varieties of the caterpillar kind in this ſtate.

The creatures in general remain wholly immoveable in this ſtate, and ſeem to have no buſineſs in it but a patient attendance on the time when they are to become butterflies; and this is a change that can happen to them, only as their parts, before extremely ſoft and weak, are capable of hardening and becoming firm by degrees, by the tranſpiration of that abundant humidity which before kept them ſoft: and this is proved by an experiment of M. Reaumur, who, incloſing ſome chryſaliſes in a glaſs tube, found, after ſome time, a ſmall quantity of water at the bottom of it; which could have come there no other way, but from the body of the incloſed animal. This tranſpiration depends greatly on the temperature of the air; it is increaſed by heat, and diminiſhed by cold; but it has alſo its peculiarities in regard to the ſeveral ſpecies of butterfly to which the chryſalis belongs.

According to theſe obſervations, the time of the duration of the animal in the chryſalis ſtate muſt be, in different ſpecies, very different; and there is indeed this wide difference in the extremes, that ſome ſpecies remain only eight days in this ſtate, and others eight months.

We know that the caterpillar changes its ſkin four or five times during its living in that ſtate; and that all theſe ſkins are at firſt produced with it from the egg, lying cloſely over one another. It parts with, or throws off, all theſe one by one, as the butterfly, which is the real animal, all this time within, grows more and more perfect in the ſeveral firſt changes. When it throws off one, it appears in another ſkin exactly of the ſame form; but at its final change from this appearance, that is, when it throws off the laſt ſkin, as the creature within is now arrived at ſuch a degree of perfection as to need no farther taking of nouriſhment, there is no farther need of teeth, or any of the other parts of a caterpillar. The creature, in this laſt change, proceeds in the very ſame manner as in all the former, the ſkin opening at the back, and the animal making its way out in this ſhape. If a caterpillar, when about to throw off this laſt ſkin, be thrown into ſpirits of wine, and left there for a few days, the membranes within will harden, and the creature may be afterwards carefully opened, and the chryſalis taken out, in which the form of the tender butterfly may be traced in all its lineaments, and its eyes, legs, &c. evidently ſeen. It is not neceſſary, however, to ſeize upon this exact time for proving the exiſtence of the chryſalis or butterfly in the caterpillar: for if one of theſe animals be thrown into ſpirit of wine, or into vinegar, ſome days before that time, and left there for the fleſh to harden, it may afterwards be diſſected, and all the lineaments of the butterfly traced out in it; the wings, legs, antennæ, &c. being as evident here, and as large, as in the chryſalis.

It is very plain from this, that the change of the caterpillar into chryſalis is not the work of a moment; but is carrying on for a long time before, even from the very hatching of the creature from the egg. The parts of the butterfly, however, are not diſpoſed exactly in the ſame manner while in the body of the caterpillar, as when left naked in the form of the chryſalis: for the wings are proportionally longer and narrower, being wound up into the form of a cord; and the antennæ are rolled up on the head; the trunk is alſo twiſted up and laid upon the head; but this in a very different manner from what it is in the perfect animal, and very different from that in which it lies within the chryſalis; ſo that the firſt formation of the butterfly in the caterpillar, by time arrives at a proper change of the diſpoſition of its parts, in order to its being a chryſalis. The very eggs, hereafter to be depoſited by the butterfly, are alſo to be found, not only in the chryſalis, but in the caterpillar itſelf, arranged in their natural, regular order. They are indeed in this ſtate very ſmall and tranſparent; but after the change into the chryſalis, they have their proper colour.

As ſoon as the ſeveral parts of the butterfly, therefore, are arrived at a ſtate proper for being expoſed to the more open air, they are thrown out from the body of the caterpillar ſurrounded only with their membranes; and as ſoon as they are arrived after this at a proper degree of ſtrength and ſolidity, they labour to break through theſe thinner coverings, and to appear in their proper and natural form. The time of their duration in this ſtate of chryſalis is very uncertain, ſome remaining in it only a few days, others ſeveral months, and ſome almoſt a year in appearance. But there is a fallacy in this that many are not aware of. It is natural to think, that as ſoon as the creature has incloſed itſelf in its ſhell, be that of what matter it will, it undergoes its change into the chryſalis ſtate. And this is the caſe with the generality: yet there are ſome which are eight or nine months in the ſhell before they become chryſaliſes, ſo that their duration in the real chryſalis ſtate is much ſhorter than it naturally appears to be. M. Reaumur carefully watched the auriculated caterpillar of the oak in its ſeveral changes, and particularly from its chryſalis, which is of this laſt kind, into the fly; and has given an account of the method of this, as an inſtance of the general courſe of nature in theſe operations.

The membranes which envelope the creature in this chryſalis ſtate are at firſt tough and firm, and immediately touch the ſeveral parts of the incloſed animal; but by degrees, as theſe parts harden, they become covered, ſome with hairs, and others with ſcales. Theſe, as they continue to grow, by degrees fall off the ſeveral particular membranes which cover the parts on which they are placed, to a greater diſtance, and by degrees looſen them from the limbs. This is one reaſon why thoſe membranes dry and become brittle.

The middle of the upper part of the CORSELET is uſually marked with a line which runs in a longitudinal direction; and this part is always more elevated than the reſt, even in the conic kinds, which are no otherwiſe angular. This line is in ſome very bold and plain; in others, it is ſo faint as not to be diſtinguiſhable without glaſſes; but it is always in the midſt of that line that the ſhell begins to open. The motion of the head of the butterfly backwards firſt occaſions this crack, and a few repetitions of the ſame motion open it the whole length of the line.

The clearing itſelf, however, entirely is a work of more time in this caſe, than is the paſſing of the chryſalis out of the body of the caterpillar. In that caſe there is a crack ſufficiently large in the ſkin of the back, and the whole chryſalis being looſe comes out at once. But in this caſe, every particular limb, and part of the body, has its ſeparate caſe; and theſe are almoſt inconceiveably thin and tender, yet it is neceſſary that every part be drawn out of them before it appear naked to the open air. As ſoon as all this is effected, and the animal is at full liberty, it either continues ſome time upon the remains of its covering, or creeps a little way diſtant from it, and there reſts. The wings are what we principally admire in this creature. Theſe are at this time ſo extremely folded up, and placed in ſo narrow a compaſs, that the creature ſeems to have none at all: but they by degrees expand and unfold themſelves; and finally, in a quarter of an hour, or half an hour at the utmoſt, they appear at their full ſize, and in all their beauty. The manner of this ſudden unfolding of the wings is this: the ſmall figure they make when the creature firſt comes out of its membranes, does not prevent the obſerving that they are at that time conſiderably thick. This is owing to its being a large wing folded up in the niceſt manner, and with folds ſo arranged as to be by no means ſenſible to the eye, for the wing is never ſeen to unfold; but, when obſerved in the moſt accurate manner, ſeems to grow under the eye to this extent. When the creature is firſt produced from the ſhell, it is everywhere moiſt and tender; even its wings have no ſtrength or ſtiffneſs till they expand themſelves; but they then dry by degrees, and, with the other parts, become rigid and firm. But if any accident prevents the wings from expanding at their proper time, that is, as ſoon as the creature is out of its ſhell, they never afterwards are able to extend themſelves; but the creature continues to wear them in their contracted and wholly uſeleſs ſtate; and very often, when the wings are in part extended before ſuch an accident happens, it ſtops them in a partial extenſion, and the creature muſt be contented to paſs its whole life with them in that manner.

M. Reaumur has proved, that heat and cold make great differences in the time of hatching the butterfly from its chryſalis ſtate: and this he particularly tried with great accuracy and attention, by putting them in veſſels in warm rooms, and in ice-houſes; and it ſeemed wholly owing to the haſtening or retarding the evaporation of the abundant humidity of the animal in the chryſalis ſtate, that it ſooner or later appeared in the butterfly form. He varniſhed over ſome chryſaliſes, in order to try what would be the effect of thus wholly preventing their tranſpiration; and the conſequence was, that the butterfly came forth from theſe two months later than their natural time. Thus was the duration of the animal in this ſtate lengthened; that is, its exiſtence was lengthened: but without any advantage to the creature, ſince it was in the time of its ſtate of inaction, and probably of inſenſibility.

Though this was of no conſequence, M. Reaumur deduces a hint from it that ſeems to be of ſome uſe. He obſerves, that hen's eggs, of which we make ſo many uſes, and eat in ſo many forms, are properly a ſort of chryſalis of the animal; their germ, after they are impregnated by the cock, containing the young animal alive; and waiting only a due degree of warmth to be hatched, and appear in its proper form. Eggs tranſpire notwithſtanding the hardneſs of their ſhells; and when they have been long kept, there is a road found near one of their ends, between the ſhell and the internal membrane, which is a mark of their being ſtale, and is the effect of an evaporation of part of their humidity: and the ſame varniſh which had been uſed to the chryſalis, being tried on eggs, was found to preſerve them for two years, as freſh as if laid but the ſame day, and ſuch as the niceſt palate could not diſtinguiſh from thoſe that were ſo. See EGGS.

It is not yet known how much farther this uſeful ſpeculation might be carried, and whether it might not be of great uſe even to human life, to invent ſomething that ſhould act in the manner of this varniſh, by being rubbed over the body, as the *athletæ* did of old, and the ſavages of the Weſt Indies do at this time, without knowing why. But to return to the inſects which are the ſubjects of this article; their third ſtate, that in which they are winged, is always very ſhort, and ſeems deſtined for no other action but the propagation of the ſpecies. See ENTOMOLOGY *Index*.

CHRYSANTHEMUM, CORN-MARYGOLD: A genus of the polygamia ſuperflua order, belonging to the ſyngeneſia claſs of plants. See BOTANY *Index*.

CHRYSES, the prieſt of Apollo, father of Aſtynome, called from him *Chryſeis*. When Lyrneſſus was taken, and the ſpoils divided among the conquerors, Chryſeis fell to the ſhare of Agamemnon. Chryſes upon this went to the Grecian camp to ſolicit his daughter's reſtoration; and when his prayers were fruitleſs, he implored the aid of Apollo, who viſited the Greeks with a plague, and obliged them to reſtore Chryſeis.

CHRYSIPPUS, a Stoic philoſopher, born at Solos in Cilicia, was diſciple to Cleanthus, Zeno's ſucceſſor. He wrote many books, ſeveral of which related to logic. None of the philoſophers ſpoke in ſtronger terms of the fatal neceſſity of every thing, nor more pompouſly of the liberty of man, than the Stoics, Chryſippus in particular. He was ſo conſiderable among them, as to eſtabliſh it into a proverb, that if it had not been for Chryſippus, the porch had never been. Yet the Stoics complained, as Cicero relates, that he had collected ſo many arguments in favour of the ſceptical hypotheſis, that he could not anſwer them himſelf; and thus had furniſhed Carneades, their antagoniſt, with weapons againſt them. There is an apophthegm of this philoſopher preſerved, which does him honour. Being told that ſome perſons ſpoke ill of him, "It is no matter (ſaid he), I will live ſo that they ſhall not be believed."

CHRYSIS, or GOLDEN-FLY. See ENTOMOLOGY *Index*.

CHRYSITRIX. See BOTANY *Index*.

CHRYSOBOLANUS, COCOA PLUM. See BOTANY *Index*.

CHRYSOCOMA, GOLDY-LOCKS. See BOTANY *Index*.

CHRYSOGONUM. See BOTANY *Index*.

CHRYSOLARUS, Emanuel, one of thoſe learned men in the 14th century who brought the Greek literature into the weſt. He was a man of rank; and deſcended from an ancient family, ſaid to have removed with Conſtantine from Rome to Byzantium. He was ſent into Europe by the emperor of the eaſt to implore the aſſiſtance of Chriſtian princes. He afterwards taught at Florence, Venice, Pavia, and Rome; and died at Conſtantinople, in 1415, aged 47. He wrote a Greek grammar, and ſome other ſmall pieces.

CHRYSOLITE, or yellowish green topaz; a precious ſtone of a graſs-green colour, found in the Eaſt Indies, Brazil, Bohemia, Saxony, Spain, in Auvergne and Bourbon in France, and in Derbyſhire in England. Some are likewiſe found with volcanic lavas, as in the Vivarais, where ſome large lumps have been ſeen of 20 or 30 pounds weight; but it is remarkable, that ſome of theſe chryſolites are partly decompoſed into an argillaceous ſubſtance. All chryſolites, however, are far from being of the ſame kind. The oriental is the ſame with the peridot, and differs only by its green hue from the ſapphires, topazes, and rubies of the ſame denomination. This becomes electric by being rubbed; has a priſmatic form of ſix, or ſometimes of five, ſtriated faces; and does not loſe its colour or tranſparency in the fire, which the common chryſolite often does; becoming either opaque, or melting entirely in a ſtrong heat. The inſtant it melts, it emits a phoſphoric light like the baſis of alum and gypſeous ſpar: with borax it produces a thin colourleſs glaſs. Its ſpecific gravity is between 3.600 and 3.700; according to Briſſon it is 2.7821, or 2.6923; and that of the Spaniſh chryſolite 3.0989.

The ſubſtance of this precious ſtone is lamellated in the direction of the axis of its primitive form; but the chryſolite from Saxony is foliated in a perpendicular direction to the ſame axis. The chryſolite of the ancients was the ſame gem which is now called *topaz*, and the name, of itſelf, indicates that it ought to be ſo.—Pliny ſays that the colour of the chroſylite is yellow like gold.

Chrysolite-*Paſte*, a kind of glaſs made in imitation of natural chryſolite, by mixing two ounces of prepared cryſtal with ten ounces of red lead, adding 12 grains of crocus martis made with vinegar; and then baking the whole for 24 hours, or longer, in a well luted cucurbit.

CHRYSOMELA, a genus of inſects belonging to the order of coleoptera. See Entomology *Index*.

CHRYSOPHYLLUM, or bully-tree. See Botany *Index*.

CHRYSOPLENIUM, See Botany *Index*.

CHRYSOPRASUS, or Chrysoprasius, the 10th of the precious ſtones mentioned in the Revelation, as forming the foundation of the heavenly Jeruſalem. The chryſopraſius is by mineralogiſts reckoned to be a variety of the chryſolite, and by Cronſtedt called the *yellowiſh green and cloudy topaz*. He conjectures that it may perhaps be the ſubſtance which ſerves as a matrix to the chryſolite; as thoſe that he had ſeen were like the clear-veined quartz, called in Sweden *milk cryſtal*, which is the firſt degree of cryſtallization.

The chryſopraſus, according to M. Magellan, is of a green colour, deeper than the chryſolite, but with a yellowiſh tinge inclining to blue like the green leek, M. Achard ſays that it is never found cryſtallized, and that it is ſemi-tranſparent. By others it is reckoned among the quartz, and its colour is ſuppoſed to be owing to the mixture of cobalt, as it gives a fine blue glaſs when melted with borax, or with fixed alkali. M. Achard, however, found the glaſs of a deep yellow when the fuſion was made with borax; and that it really contains ſome calx of copper inſtead of cobalt. M. Dutens ſays, that ſome gold has been found in this kind of ſtone; but this laſt belongs in all probability, ſays M. Magellan, to another claſs of ſubſtances, viz. the vitreous ſpars.

To the latter belongs moſt probably the aventurine, whoſe colour is generally a yellow brown red; though ſometimes it inclines more to the yellow, or greeniſh, than to the red. Theſe ſtones are not quite tranſparent: ſome indeed ſhine with ſuch a brilliancy, as to render them of conſiderable value, but they are very rare. The common aventurine is but an artificial glaſs of various colours, with which powder of gold has been mixed; and theſe imitated aventurines ſo frequently excel the native ones in ſplendour, that the eſteem of the latter is now much lowered. With regard to the chryſopraſus, its name, from πρασον, ſhows it to be of a greeniſh blue colour, like the leaves of a leek; it only differs from the chryſolite in its bluiſh hue.

CHRYSOSTOM, St John, a celebrated patriarch of Conſtantinople, and one of the moſt admired fathers of the Chriſtian church, was born of a noble family at Antioch, about the year 347. He ſtudied rhetoric under Libavius, and philoſophy under Andragathus, after which he ſpent ſome time in ſolitude in the mountains near Antioch; but the auſterities he endured having impaired his health, he returned to Antioch, where he was ordained deacon by Meletius. Flavian, Meletius's ſucceſſor, raiſed him to the office of preſbyter five years after: when he diſtinguiſhed himſelf ſo greatly by his eloquence, that he obtained the ſurname of *Golden Mouth*. Nectarius patriarch of Conſtantinople dying in 397, St Chryſoſtom, whoſe fame was ſpread throughout the whole empire, was choſen in his room by the unanimous conſent of both the clergy and the people. The emperor Arcadius confirmed this election, and cauſed him to leave Antioch privately, where the people were very unwilling to part with him. He was ordained biſhop on the 26th of February 398; when he obtained an order from the emperor againſt the Eunomians and Montaniſts; reformed the abuſes which ſubſiſted amongſt his clergy; retrenched a great part of the expences in which his predeceſſors had lived, in order to enable him to feed the poor and build hoſpitals, and preached with the utmoſt zeal againſt the pride, luxury, and avarice of the great. But his pious liberty of ſpeech procured him many powerful enemies. He differed with Theophilus of Alexandria, who got him depoſed and baniſhed; but he was ſoon recalled. After this, declaiming againſt the dedication of a ſtatue erected to the empreſs, ſhe baniſhed him into Cucuſus in Armenia, a moſt barren inhoſpitable place; afterwards, as they were removing him from Petyus, the ſoldiers treated him ſo roughly, that he died by the way, A. D. 407. The beſt edition of his works is that publiſhed at Paris in 1718, by Montfauçon.

CHRYSTAL. See CRYSTAL.

CHUB, or CHUBB, in *Ichthyology*. See CYPRINUS, ICHTHYOLOGY *Index*.

The reſorts of this fiſh are eaſily found, for they are generally holes overſhadowed by trees, and this fiſh will be ſeen floating in ſuch almoſt on the ſurface of the water in a hot day in great numbers. They are but a poor fiſh for the table, and are very full of bones; but they entertain the angler very much, and are of the number of thoſe that are eaſily taken.

CHUBB, THOMAS, a noted polemical writer, born at Eaſt Harnbam, a village near Saliſbury, in 1779. He was put apprentice to a glover at Saliſbury, and afterwards entered into partnerſhip with a tallow-chandler. Being a man of ſtrong natural parts, he employed all his leiſure in reading; and though a ſtranger to the learned languages, became tolerably verſed in geography, mathematics, and other branches of ſcience. His favourite ſtudy was divinity; and he formed a little ſociety for the purpoſe of debating upon religious ſubjects, about the time that the Trinitarian controverſy was ſo warmly agitated between Clarke and Waterland. This ſubject, therefore, falling under the cognizance of Chubb's theological aſſembly, he at their requeſt drew up and arranged his ſentiments on it, in a kind of diſſertation; which was afterwards publiſhed under the title of *The Supremacy of the Father aſſerted*, &c. In this piece Mr Chubb ſhowed great talents in reaſoning, and acquired ſo much reputation, that the late Sir Joſeph Jekyll, maſter of the rolls, took him into his family to enjoy his converſation: but though he is ſaid to have been tempted to remain with him by the offer of a genteel allowance, he did not continue with him many years; but choſe to return to his friends at Saliſbury. He publiſhed afterwards a 4to volume of tracts, which Mr Pope informs his friend Gay, he "read through with admiration of the writer, though not always with approbation of his doctrine." He died a ſingle man in the 68th year of his age, and left behind him two vols. of poſthumous tracts, in which he appears to have had little or no belief in revelation. But however licentious his way of thinking may be deemed, nothing irregular or immoral has been fairly imputed to him in his life and actions.

CHUDLEIGH, LADY MARY, was born in 1656, and married to Sir George Chudleigh, Baronet, by whom ſhe had ſeveral children: her poems and eſſays have been much admired for delicacy of ſtyle. She died in 1710; and is ſaid to have written ſeveral dramatic pieces, which, though not printed, are preſerved in the family.

CHUPMESSAHITES, a ſect among the Mahometans, who believe that Jeſus Chriſt is God, and the true Meſſiah, the Redeemer of the world; but without rendering him any public or declared worſhip. The word in the Turkiſh language ſignifies *Protector of the Chriſtians*. Recaut. ſays, there are abundance of theſe Chupmeſſahites among the people of faſhion in Turkey, and ſome even in the ſeraglio.

CHURCH, has different ſignifications, according to the different ſubjects to which it is applied.

1. It is underſtood of the collective body of Chriſtians, or all thoſe over the face of the whole earth who profeſs to believe in Chriſt, and acknowledge him to be the Saviour of mankind. This is what the ancient writers call the *catholic* or *univerſal church*. Sometimes the word church is conſidered in a more extenſive ſenſe, and divided into ſeveral branches; as the church militant, is the aſſembly of the faithful on the earth; the church triumphant, that of the faithful already in glory; to which the Papiſts add the church patient; which, according to their doctrines, is that of the faithful in purgatory.

2. Church is applied to any particular congregation of Chriſtians, who aſſociate together and concur in the participation of all the inſtitutions of Jeſus Chriſt, with their proper paſtors and miniſters. Thus we read of the church of Antioch, the church of Alexandria, the church of Theſſalonica, and the like.

3. Church denotes a particular ſect of Chriſtians diſtinguiſhed by particular doctrines and ceremonies. In this ſenſe, we ſpeak of the Romiſh church, the Greek church, the Reformed church, the church of England, &c.

The Latin or Weſtern church, comprehends all the churches of Italy, France, Spain, Africa, the north, and all other countries whither the Romans carried their language. Great Britain, part of the Netherlands of Germany, and of the North, have been ſeparated from hence ever ſince the time of Henry VIII.; and conſtitute what we call the Reformed Church, and what the Romaniſts call the weſtern ſchiſm.

The Greek, or Eaſtern church, comprehends the churches of all the countries anciently ſubject to the Greek or eaſtern empire, and through which their language was carried; that is, all the ſpace extended from Greece to Meſopotamia and Perſia, and thence into Egypt. This church has been divided from the Roman ever ſince the time of the emperor Phocas.

The Gallican church, denotes the church of France, under the government and direction of their reſpective biſhops and paſtors. This church has always enjoyed certain franchiſes and immunities; not as grants from popes but as derived to her from her firſt original, and which ſhe has taken care never to relinquiſh. Theſe liberties depend upon two maxims; the firſt, that the pope has no authority or right to command or order any thing, either in general or in particular, in which the temporalties and civil rights of the kingdom are concerned; the ſecond, that, notwithſtanding the pope's ſupremacy is owned in caſes purely ſpiritual, yet in France his power is limited and regulated by the decrees and canons of ancient councils received in that realm.

4. The word *church* is uſed to ſignify the body of eccleſiaſtics, or the clergy, in contradiſtinction to the laity. See CLERGY.

5. Church is uſed for the place where a particular congregation or ſociety of Chriſtians aſſemble for the celebration of divine ſervice. In this ſenſe churches are variouſly denominated, according to the rank, degree, diſcipline, &c. as Metropolitan church, Patriarchal church, Cathedral church, Parochial church, Collegiate church, &c. See METROPOLIS, PATRIARCH, &c.

In eccleſiaſtical writers we meet with *grand church*, for the chief church of a place; particularly in the Greek liturgy, for the church of St Sophia at Conſtantinople, the ſee of the patriarch, founded by Conſtantine, and conſecrated under Juſtinian. It was at that time ſo magnificent, that Juſtinian is ſaid to have cried out in the conſecration thereof, Ενικησα σε, Σολομων; *I have outdone thee, Solomon.* The dome, which is ſaid to have been the firſt that was built, is 330 feet diameter.

The firſt church publicly built by the Chriſtians, ſome authors maintain to be that of St Saviour at Rome founded by Conſtantine; others contend, that ſeveral churches abroad, called by the name of *St Peter Vivus*, were built in honour of that apoſtle during his lifetime.

Church, with regard to architecture, Daviler defines a large oblong edifice, in form of a ſhip, with nave, choir, aiſles, chapel, belfry, &c. See each part under its proper head.

Church, Simple, is that which has only a nave and a choir.

Church with Aiſles, that which has a row of porticoes, in form of vaulted galleries, with chapels in its circumference.

Church in a Greek croſs, that where the length of the traverſe part is equal to that of the nave; ſo called becauſe moſt of the Greek churches are built in this form.

Church in a Latin croſs, that whoſe nave is longer than the croſs part, as in moſt of the Gothic churches.

Church in Rotundo, that whoſe plan is a perfect circle, in imitation of the Pantheon.

For the form of the ancient Greek churches, when they had all their parts, it was as follows: firſt was a porch, or portico, called the *vaunt-nave*, προναος; this was adorned with columns on the outſide, and on the inſide ſurrounded with a wall; in the middle whereof was a door, through which they paſſed into a ſecond portico. The firſt of theſe porticoes was deſtined for the *energumeni*, and penitents in the firſt ſtage of their repentance; the ſecond was much longer, deſtined for penitents of the ſecond claſs, and the catechumens, and hence called ναρθης, *ferula*, becauſe thoſe placed in it began to be ſubject to the diſcipline of the church. Theſe two porticoes took up about one third of the ſpace of the church. From the ſecond portico they paſſed into the nave, ναος, which took up near another third of the church. In the middle, or at one ſide of the nave, was the ambo, where the deacons and prieſts read the goſpel and preached. The nave was deſtined for the reception of the people, who here aſſiſted at prayers.

Near the entrance of this was the baptiſtery or font. Beyond the nave was the choir, χορος, ſet with ſeats, and round: the firſt ſeat on the right, next the ſanctuary, being for the chantor, or *choragus*.

From the choir they aſcended by ſteps to the ſanctuary, which was entered at three doors. The ſanctuary had three upſides in its length; a great one in the middle, under which was the altar, crowned with a baldachin, ſupported by four columns. Under each of the ſmall upſides, was a kind of table or cupboard, in manner of a beaufet.

Though, of the Greek churches now remaining, few have all the parts above deſcribed, moſt of them having been reduced to ruins or converted into moſques.

High Church was a denomination originally given to thoſe otherwiſe called *Nonjurors*, who refuſed to acknowledge the title of William III. to the crown of Great Britain, under a notion that James II. though excluded, was ſtill their rightful ſovereign. This appellation was given them, becauſe they entertained high notions of the dignity and power of the church, and the extent of its prerogative and juriſdiction. And thoſe, on the contrary, were called *low-church men*, who diſapproved of the ſucceſſion and obſtinacy of the nonjurors, diſtinguiſhed themſelves by their moderation toward diſſenters, and were leſs ardent in extending the limits of church authority. The denomination of *high-church men* is now more generally applied to all who form pompous and ambitious conceptions of the authority and juriſdiction of the church, and who would raiſe it to an abſolute independence on all human power.

Church-Ale. See *Whitsun-Ale.*

Church Reeves, the ſame with *Church-Wardens.*

Church-Scot, or *Churcheſſet*, a payment or contribution, by the Latin writers frequently called *primitiæ ſeminum*; being, at firſt, a certain meaſure of wheat, paid to the prieſt on St Martin's day, as the firſt fruits of harveſt. This was enjoined by the laws of King Malcolm IV. and Canute, c. 10. But after this, *Church-ſcot* came to ſignify a reſerve of corn-rent paid to the ſecular prieſts, or to the religious; and ſometimes was taken in ſo general a ſenſe as to include poultry, or any other proviſion that was paid in kind to the religious. See Tithe.

Church-Wardens (eccleſſiæ guardiani), in the Engliſh eccleſiaſtical polity, are the guardians or keepers of the church, and repreſentatives of the body of the pariſh. They are ſometimes appointed by the miniſter, ſometimes by the pariſh, ſometimes by both together, as cuſtom directs. They are taken, in favour of the church, to be, for ſome purpoſes, a kind of corporation at the common law; that is, they are enabled, by that name, to have a property in goods and chattles, and to bring actions for them, for the uſe and profit of the pariſh. Yet they may not waſte the church goods, but may be removed by the pariſh, and then called to account by actions at common law: but there is no method of calling them to account but by firſt removing them; for none can legally do it but thoſe who are put in their place. As to lands, or other real property, as the church, churchyard, &c. they have no ſort of intereſt therein; but if any damage is done thereto, the parſon only or vicar ſhall have the action. Their office alſo is to repair the church, and make rates and levies for that purpoſe: but theſe are recoverable only in the eccleſiaſtical courts. They are alſo joined with the overſeers in the care and maintenance of the poor. They are to levy a ſhilling forfeiture on all ſuch as do not repair to church on Sundays and holidays; and are empowered to keep all perſons orderly while there; to which end it has been held that a church-warden may juſtify the pulling off a man's hat, without being guilty of either an aſſault or a treſpaſs. There are alſo a multitude of other petty parochial powers committed to their charge by divers acts of parliament.

CHURCHILL, Sir Winston, the father of the great duke of Marlborough, was deſcended from an ancient and honourable family in Dorſetſhire. He was born at Wotton Glanville in that county in 1610; and

Churchill

Churchill.

and educated at St John's college at Oxford. He engaged in the cauſe of his unfortunate ſovereign Cha. I. for which he ſuffered ſeverely in his fortune; and having married, while young, Elizabeth, the daughter of Sir John Drake of Aſhe in Devonſhire, ſhe was forced to ſeek a refuge in her father's houſe, when Mr Churchill's misfortunes left him none that he could call his own; and there moſt of his children were born. After the reſtoration, he was elected a burgeſs to ſerve in parliament for the borough of Weymouth; and, in 1669, his majeſty was pleaſed to confer on him the honour of knighthood. The next year he was made one of the commiſſioners of claims in Ireland; and upon his return from thence, was conſtituted one of the clerks comptrollers of the green cloth: but writing a kind of political eſſay upon the Hiſtory of England, which gave great offence to the parliament, he was, in 1678, diſmiſſed from his poſt. He was, however, ſoon reſtored to it again; and lived to ſee his eldeſt ſurviving ſoon raiſed to the peerage, and the reſt of his children in a fair way to promotion. He died in 1688.

CHURCHILL, *John*, duke of Marlborough, and prince of the holy Roman empire, a moſt renowned general and ſtateſman, was born at Aſhe in Devonſhire in 1650. He was eldeſt ſon of Sir Winſton Churchill, who carried him to court while very young, and where he was particularly favoured by James duke of York, afterwards King James II. when only twelve years of age. In 1666, he was made an enſign of the guards during the firſt Dutch war; and afterwards improved himſelf greatly in the military art at Tangier. In 1672, Mr Churchill attended the duke of Monmouth, who commanded a body of auxiliaries in the French ſervice, and was ſoon after made a captain in the duke's own regiment. At the ſiege of Nimeguen, which happened in that campaign, he diſtinguiſhed himſelf ſo much that he was taken notice of by the celebrated Marſhal Turenne, who beſtowed on him the name of the *handſome Engliſhman*.—In 1673, he was at the ſiege of Maeſtricht, where he gained ſuch applauſe, that the king of France made him a public acknowledgement of his ſervice; and the duke of Monmouth, who had the direction of the attack, told King Charles II. that he owed his life to Mr Churchill's bravery. In 1681, he married Sarah, daughter and co-heireſs (with her ſiſter the counteſs of Tyrconnel) of Richard Jennings, Eſq. of Sandrich, in Hertfordſhire. The duke of York recommended him in a very particular manner to the king; who, in 1682, created him baron of Eyemouth in the county of Berwick, in Scotland, and made him colonel of the third troop of guards. A little after King James's acceſſion, he was created Baron Churchill of Sandrich in the county of Hertford, and made brigadier-general of his majeſty's army in the weſt; where, when the duke of Monmouth came to ſurpriſe the king's army while the earl of Feverſham and the majority of the officers were in their beds, he kept the enemy in play, till the king's forces had formed themſelves, and thereby ſaved the whole army. When James ſhowed an intention of eſtabliſhing the Catholic religion in Britain, Lord Churchill, notwithſtanding the great obligations he owed him, thought it his duty to abandon the royal cauſe; but even then did not leave him without acquainting him by letter with the reaſon of his ſo doing. Lord Churchill was graciouſly received by the prince of Orange; and was by him employed firſt to re-aſſemble the troop of guards at London, and afterwards to reduce ſome lately raiſed regiments, and to new-model the army; for which purpoſe he was inveſted with the rank and title of lieutenant-general. In 1689, he was ſworn one of the privy council, and one of the gentlemen of the king's bed-chamber; and on the 9th of April following, was raiſed to the dignity of earl of Marlborough in the county of Wilts. He aſſiſted at the coronation of their majeſties; and was ſoon after made commander in chief of the Engliſh forces ſent over to Holland; and here he firſt laid the foundation of that fame which was afterwards ſpread over all Europe. In 1690, he was made general of the forces ſent to Ireland; where he made the ſtrong garriſons of Cork and Kinſale priſoners of war. The year following, King William ſhowed the good opinion he had of his conduct, by ſending him to Flanders to put all things in readineſs, and to draw the army together before his arrival. In 1692, he was diſmiſſed from all his employments; and, not long after, was with ſome other peers committed to the tower on an accuſation of high treaſon; which, however, was afterwards found to be a falſe and malicious report, the authors of which were puniſhed. Marlborough was ſoon reſtored to favour, and in 1698 was appointed governor to the earl of Glouceſter; with this extraordinary compliment from King William, "My lord, make him but what you are, and my nephew will be all I wiſh to ſee him." The ſame day he was again ſworn one of the privy council; and in July following was declared one of the lords juſtices of England, for the adminiſtration of the government, in which great truſt he was three times ſucceſſively in the king's abſence. In 1701 he was appointed general of the foot, commander in chief of the Engliſh forces, and ambaſſador extraordinary and plenipotentiary at the Hague. Upon the acceſſion of Queen Anne to the throne, he was elected into the order of the garter, declared captain-general of all her majeſty's forces, and ſent ambaſſador extraordinary and plenipotentiary to Holland. After ſeveral conferences about a war, he put himſelf at the head of the army, where all the other generals had orders to obey him. His exploits in the field have been taken notice of under the article BRITAIN, N° 344—370: we ſhall therefore only take notice in this place of the rewards and honours conferred upon him for theſe exploits. After his firſt campaign he was created marquis of Blandford and duke of Marlborough, with a penſion of 5000l. out of the poſt-office, to devolve for ever upon thoſe enjoying the title of duke of Marlborough. In 1703, he met Charles III. late emperor, going to Spain, who preſented him with a ſword ſet with diamonds. In 1704, having forced the enemy's lines at Schellenberg, he received a letter of thanks from the emperor Leopold, written with his own hand; an honour ſeldom done to any but ſovereign princes. After the battle of Blenheim, he received congratulatory letters from moſt of the potentates in Europe, particularly from the ſtates-general, and from the emperor, who deſired him to accept of the dignity of a prince of the empire, which with the queen's leave was conferred upon him by the title of *Prince of Mildenheim in the province of Suabia.* After the campaign was ended, he viſited the court of Pruſſia, where he laid ſuch ſchemes as ſuſpended the diſputes with the Dutch about King William's eſtate; which wiſe conduct cauſed the whole confederacy to acknowledge that he had done the greateſt ſervice poſſible to the common cauſe. Upon his return to England, the queen, to perpetuate his memory, granted the intereſt of the crown in the honour and manor of Woodſtock and hundred of Wotton to him and his heirs for ever. In 1705 he made a tour to Vienna, upon the invitation of the emperor Joſeph; who highly careſſed him, and made him a grant of the lordſhip of Mildenheim. After the campaign of 1708, the ſpeaker of the houſe of commons was ſent to Bruſſels on purpoſe to compliment him; and on his return to England he was again complimented in the houſe of lords by Lord Chancellor Cowper. All his ſervices, however, and all the honours conferred upon him, were not ſufficient to preſerve him from being diſgraced. After the change of the miniſtry in 1710, his intereſt daily declined; and in 1712, on the firſt day of the new year, he was removed from all his places. Finding all arts uſed to render him obnoxious in his native country, he viſited his principality of Mildenheim, and ſeveral towns in Germany; after which he returned to England, and arrived there on the day of the queen's death. After being welcomed by the nobility and foreign miniſters, he attended on King George I. in his public entry through London, who appointed him captain-general, colonel of the firſt regiment of foot guards, one of the commiſſioners for the government of Chelſea hoſpital, and maſter-general of the ordnance. Some years before his death, he retired from public buſineſs. He died at Windſor-lodge in 1722, aged 73; leaving behind him a very numerous poſterity, allied to the nobleſt and greateſt families in theſe kingdoms. Upon his demiſe all parties united in doing honour or rather juſtice to his merit, and his corpſe was interred the 9th of Auguſt following, with all the ſolemnity due to a perſon who had deſerved ſo highly of his country, in Weſtminſter-abbey. The noble pile near Woodſtock, which bears the name of Blenheim-houſe, may be juſtly ſtyled his monument: but without pretending to the gift of prophecy, one may venture to foretel, that his glory will long ſurvive that ſtructure; and that ſo long as our hiſtories remain, or indeed the hiſtories of Europe, his memory will live and be the boaſt of Britain, which by his labours was raiſed to be the firſt of nations, as during the age in which he lived he was deſervedly eſteemed the firſt of men. If he had foibles, as theſe are inſeparable from human nature, they were ſo hidden by the glare of his virtues as to be ſcarcely perceived, or were willingly forgotten. A certain paraſite, who thought to pleaſe Lord Bolingbroke by ridiculing the avarice of the duke, was ſtopt ſhort by his lordſhip; who ſaid, "He was ſo very great a man, that I forget he had that vice."

Out of a variety of anecdotes and teſtimonies concerning this illuſtrious perſonage, collected in the new edition of the *Biographia Britannica*, the following ſelection may ſerve to illuſtrate more particularly his diſpoſition and manners.

One of the firſt things which he did, when very young, was to purchaſe a box to put his money in; an indication this of the economical, not to ſay avaricious, temper that accompanied him through life. Dr Joſeph Warton relates, that, on the evening of an important battle, the duke was heard to chide his ſervant for having been ſo extravagant as to light four candles in his tent when Prince Eugene came to confer with him. Mr Tyers, on the other hand, mentioned a circumſtance, which, if well founded, redounds to his grace's generoſity; though in a different reſpect it is much to his diſcredit: It is, that during the rebellion in 1715, he ſent 10,000l. to the earl of Mar. We conſider the ſtory only as a traditional report, which has not in itſelf any great degree of probability; and therefore we are by no means convinced of its truth. The late Mr Richardſon junior, the painter, hath recorded a pleaſing inſtance of the duke's calmneſs of diſpoſition; for which, indeed, he was always remarkable. "The duke of Marlborough (ſays the writer), riding out once with Commiſſary Marriot, near the commiſſary's houſe in the country, it began to rain, and the duke called for his cloak; Marriot having his put on by his ſervant immediately. The duke's ſervant not bringing the cloak, he called for it again; but the man was ſtill puzzling about the ſtraps and buckles. At laſt, it raining now very hard, the duke called again, and aſked him, "what he was about that he did not bring his cloak?" 'You muſt ſtay (grumbles the fellow), if it rains cats and dogs, till I can get at it.' The duke only turned to Marriot and ſaid, "I would not be of that fellow's temper." The duke of Marlborough (adds Mr Richardſon) did by nature and conſtitution, what Seneca judged by philoſophy ought to be done. *Quid eſt quare ego ſervi mei hilarius reſponſum, et contumaciorem vultum, flagellis et compedibus expiem?*

Dr Swift, in one of his letters to Stella, relates the following particulars concerning the duke of Marlborough. "I was early this morning with Secretary St John, and gave him a memorial to get the queen's letter for the firſt-fruits, who has promiſed to do it in a very few days. He told me 'he had been with the duke of Marlborough, who was lamenting his former wrong ſteps in joining with the Whigs, and ſaid he was worn out with age, fatigue, and misfortunes.' I ſwear it pitied me; and I really think they will not do well in too much mortifying that man, although indeed it is his own fault. He is covetous as hell, and ambitious as the prince of it: he would fain have been general for life, and has broken all endeavours for peace, to keep his greatneſs and get money. He told the queen 'he was neither covetous nor ambitious.' She ſaid, 'if ſhe could conveniently have turned about, ſhe would have laughed, and could hardly forbear it in his face.' He fell in with all the abominable meaſures of the late miniſtry, becauſe they gratified him for their own deſigns. Yet he has been a ſucceſsful general, and I hope he will continue his command."

Various characters have been drawn of the duke of Marlborough; moſt of which we ſhall omit, as either already ſufficiently known, or as not meriting particular notice. That which is given of him by Dr Swift, in his "Hiſtory of the four laſt years of the queen," has all the malignity and meanneſs of a party pamphlet. It is even ſo fooliſh as to inſinuate, that the duke's military accompliſhments were problematical, and that he was deſtitute of perſonal courage. Mr Macpherſon's character of his grace is very elaborately compoſed, and diſplays no ſmall degree of ability and penetration; though it is not, perhaps, entirely free from prejudice. The hiſtorian conſiders it as a fact, that Lord Churchill, at the time of the revolution, had a deſign of placing his unfortunate maſter king James II. a priſoner in the hands of his rival the prince of Orange. But this ſtory muſt be regarded as wholly unworthy of credit. It is founded upon ſuggeſtions and informations ſo groundleſs and even ridiculous, that it cannot deſerve a formal refutation. On the other hand, Mr Macpherſon has done juſtice to the duke of Marlborough's proſecution of the war in Flanders, and hath ſhown that he conducted it upon the principles of ſound wiſdom and good policy.

There are two teſtimonies to the honour of the duke's memory, by two celebrated noble writers, which cannot be paſſed over. One is by Lord Bolingbroke, in his letters on the Study and Uſe of Hiſtory. Speaking of the conſternation raiſed among the allies of the grand confederacy by the death of King William, and of the joy which that event gave to the French, his lordſhip obſerves, that "a ſhort time ſhowed how vain the fears of ſome and the hopes of others were. By his death, the duke of Marlborough was raiſed to the head of the army, and indeed of the confederacy: where he, a new, a private man, a ſubject, acquired, by merit and by management, a more deciding influence than high birth, confirmed authority, and even the crown of Great Britain, had given to King William. Not only all the parts of that vaſt machine, the grand alliance, were kept more compact and entire, but a more rapid and vigorous motion was given to the whole: and inſtead of languiſhing out diſaſtrous campaigns, we ſaw every ſcene of the war full of action. All thoſe wherein he appeared, and many of thoſe wherein he was not then an actor, but abettor however of their action, were crowned with the moſt triumphant ſucceſs. I take, with pleaſure, this opportunity of doing juſtice to that great man, whoſe faults I knew, whoſe virtues I admired; and whoſe memory, as the greateſt general, and as the greateſt miniſter, that our country, or perhaps any other, has produced, I honour."

The other teſtimony to the duke's accompliſhments is by the earl of Cheſterfield, in his Letters to his Son. "Of all the men (ſays his lordſhip) that ever I knew in my life (and I knew him extremely well), the late duke of Marlborough poſſeſſed the graces in the higheſt degree, not to ſay engroſſed them: and indeed he got the moſt by them; for I will venture (contrary to the cuſtom of profound hiſtorians, who always aſſign deep cauſes for great events) to aſcribe the better half of the duke of Marlborough's greatneſs and riches to thoſe graces. He was eminently illiterate; wrote bad Engliſh, and ſpelled it ſtill worſe. He had no ſhare of what is commonly called *parts*; that is, he had no brightneſs, nothing ſhining in his genius. He had had, moſt undoubtedly, an excellent good plain underſtanding, with ſound judgment. But theſe alone would probably have raiſed him but ſomething higher than they found him, which was page to King James II.'s queen. There the graces protected and promoted him: for while he was an enſign of the guards, the ducheſs of Cleveland, then favourite miſtreſs to King Charles II. ſtruck by thoſe very graces, gave him 5000l.; with which he immediately bought an annuity for his life of 500l. of my grandfather Halifax; which was the foundation of his ſubſequent fortune. His figure was beautiful; but his manner was irreſiſtible by either man or woman. It was by this engaging graceful manner that he was enabled, during all his war, to connect the various and jarring powers of the grand alliance, and to carry them on to the main object of the war, notwithſtanding their private and ſeparate views, jealouſies, and wrongheadedneſſes. Whatever court he went to (and he was often obliged to go himſelf to ſome teſty and refractory ones), he as conſtantly prevailed, and brought them into his meaſures. The penſionary Heinſius, a venerable old miniſter, grown gray in buſineſs, and who had governed the republic of the United Provinces for more than 40 years, was abſolutely governed by the duke of Marlborough, as that republic feels to this day. He was always cool; and nobody ever obſerved the leaſt variation in his countenance: he could refuſe more gracefully than other people could grant; and thoſe who went away from him the moſt diſſatisfied as to the ſubſtance of their buſineſs, were yet perſonally charmed with him, and in ſome degree comforted by his manner. With all his gentleneſs and gracefulneſs, no man living was more conſcious of his ſituation, nor maintained his dignity better."

A peruſal of the above paſſage will convince us of the frivolous turn of the earl of Cheſterfield's mind. His lordſhip, in his zeal to exalt the duke of Marlborough's external accompliſhments, either forgets or depreciates the far greater talents of which he was poſſeſſed. There is an obſervation upon the ſubject in the Britiſh Biography, with which we entirely concur. "That the duke of Marlborough (ſays the writer) was eminently diſtinguiſhed for the gracefulneſs of his manners, cannot be queſtioned; but the earl of Cheſterfield appears to have attributed too much to their influence, when he aſcribes—the better half of the duke of Marlborough's greatneſs and riches to thoſe graces. That the uncommon gracefulneſs of his manners facilitated his advancement, and contributed to the ſucceſs of his negociations, may readily be admitted; but ſurely it muſt have been to much higher qualities that he owed the eſteem of King William and of Prince Eugene, his reputation throughout all Europe, and his many victories and conqueſts. It was not by a polite exterior that he obtained his laurels at Schellenberg, at Oudenarde, at Ramillies, and at Blenheim."

How much the duke of Marlborough has been celebrated by our poets, is well known by Addiſon's "Campaign;" and by Philip's "Blenheim." Mr Addiſon, in his Roſamond, has properly aſſumed another and voluntary occaſion of paying a fine compliment to his grace's military exploits, and the glory by which they would be followed. Upon the duke's removal from his places, an ode was inſcribed to him by Mr Somerville, animated with all the zeal of whiggiſh enthuſiaſm, and containing ſome paſſages that are truly poetical. Another ode, not much inferior in ſpirit, was addreſſed to his grace, on occaſion of his embarking for Oſtend in the year 1712.

The duke of Marlborough's Scots title of Baron Eyemouth, being to heirs male, died with himſelf; but his Engliſh title going to his daughters and their heirs-male, went into the Spencer family, who retain their own ſurname of Spencer.

Churchill, *Charles*, a celebrated ſatiriſt, the ſon of Mr Charles Churchill, curate and lecturer of St John's, Weſtminſter, was educated at Weſtminſter ſchool, and received ſome applauſe for his abilities from his tutors in that famous ſeminary. His capacity, however, was greater than his application, ſo that he acquired the character of a boy that could do good if he would. As the ſlighteſt accounts of perſons ſo noted are agreeable, it may not be amiſs to obſerve, that having one day got an exerciſe to make, and from idleneſs or inattention, having failed to bring it at the time appointed, his maſter thought proper to chaſtiſe him with ſome ſeverity, and even reproached his ſtupidity: what the fear of ſtripes could not effect, the fear of ſhame ſoon produced, and he brought his exerciſe the next day, finiſhed in ſuch a manner, that he received the public thanks of all the maſters. Still, however, his progreſs in the learned languages was but ſlow: nor is it to be wondered at, if we conſider how difficult it was for a ſtrong imagination, ſuch as he was poſſeſſed of, to conform and walk tamely forward in the trammels of a ſchool education: minds like his are ever ſtarting aſide after new purſuits; deſirous of embracing a multiplicity of amuſing objects; eager to come at an end, without the painful inveſtigation of the means. In ſhort, for want of proper ſkill in theſe languages, he was rejected from Oxford, whither his father had ſent him; and probably this might have given occaſion to the frequent invectives we find in his works againſt that moſt reſpectable univerſity. Upon his return from thence, he again applied to his ſtudies in Weſtminſter ſchool, where, at 17 years of age, he contracted an intimacy with a lady, to whom he was married, and their mutual regard for each other continued for ſeveral years. At the uſual age of going into orders, Mr Churchill was ordained by the late biſhop of London, and obtained a ſmall curacy in Wales of 30l. a-year. Thither he carried his wife; they took a ſmall houſe; and he paſſed through the duties of his ſtation with aſſiduity and cheerfulneſs. Happy had it been for him had he continued there to enjoy the fruits of piety, peace, and ſimplicity of manners. He was beloved and eſteemed by his pariſhioners; and though his ſermons were rather above the level of his audience, they were commended and followed. But endeavouring to advance his fortune, by keeping a cyder cellar, it involved him in difficulties which obliged him to leave Wales and come to London. His father dying ſoon after, he ſtepped into the church in which he had officiated; and in order to improve his income, which ſcarcely produced 100l. a-year, he taught young ladies to read and write Engliſh at a boarding ſchool, kept by Mrs Dennis, where he behaved with that decency and decorum which became his profeſſion. His method of living, however, bearing no proportion to his income, he contracted ſeveral debts in the city; which being unable to pay, a jail, the terror of indigent genius, ſeemed ready to complete his misfortunes; but from this ſtate of wretchedneſs he was relieved by the benevolence of Mr Lloyd, father to the poet of that name. Meanwhile, Mr Lloyd, the ſon, wrote a poetical epiſtle called the *Actor*, which being read and approved by the public, gave the author a diſtinguiſhed place among the writers of his age. This induced Mr Churchill to write the *Roſciad*. It firſt came out without the author's name; but the juſtneſs of the remarks, and the ſeverity of the ſatire, ſoon excited public curioſity. Though he never diſowned his having written this piece, and even openly gloried in it; yet the public, unwilling to give ſo much merit to one alone, aſcribed it to a combination of wits; nor were Meſſrs Lloyd, Thornton, or Colman, left unnamed upon this occaſion. This miſplaced praiſe ſoon induced Mr Churchill to throw off the maſk, and the ſecond edition appeared with his name at full length. As the Roſciad was the firſt of this poet's performances, ſo many are of opinion that it is the beſt. In it we find a very cloſe and minute diſcuſſion of the particular merit of each performer; their defects pointed out with candour, and their merits praiſed without adulation. This poem, however, ſeems to be one of thoſe few works which are injured by ſucceeding editions; when he became popular, his judgment began to grow drunk with applauſe; and we find, in the later editions, men blamed whoſe merit was inconteſtable, and others praiſed that were at that time in no degree of eſteem with the judicious. His next performance was his *Apology to the Critical Reviewers*. This work is not without its peculiar merit; and as it was written againſt a ſet of critics whom the world was willing enough to blame, the public read it with their uſual indulgence. In this performance he ſhowed a particular happineſs of throwing his thoughts, if we may ſo expreſs it, into poetical paragraphs; ſo that the ſentence ſwells to the break or concluſion, as we find in proſe.

But while his writings amuſed the town, his actions diſguſted it. He now quitted his wife, with whom he had cohabited many years; and reſigning his gown and all clerical functions, commenced a complete *man of the town*, got drunk, frequented ſtews; and, giddy with falſe praiſe, thought his talents a ſufficient atonement for all his follies. In ſome meaſure to palliate the abſurdities of his conduct, he now undertook a poem called *Night*, written upon a general ſubject indeed, but upon falſe principles; namely, that whatever our follies are, we ſhould never attempt to conceal them. This, and Mr Churchill's other poems, being ſhown to Dr Johnſon, and his opinion being aſked, he allowed them but little merit; which being told to the author, he reſolved to requite this private opinion with a public one. In his next poem, therefore, of the *Ghoſt*, he has drawn this gentleman under the character of Pomposo; and thoſe who diſliked Mr Johnſon allowed it to have merit. Mr Johnſon's only reply to Churchill's abuſe was, "that he thought him a ſhallow fellow in the beginning, and could ſay nothing worſe of him ſtill." The poems of Night and the Ghoſt had not the rapid ſale the author expected; but his *Prophecy of Famine* ſoon made ample amends for the late paroxyſm in his fame. In this piece, written in the ſpirit of the famous North Briton, he exerted his virulent pen againſt the whole Scottiſh nation, adopting the prejudices of the mob, and dignifying ſcurrility by the aid of a poetic imagination. It had a rapid and extenſive ſale, as propheſied by Mr Wilkes; who ſaid before its publication that he was ſure it muſt take, as it was at once perſonal, poetical, and political. After its appearance, it was aſſerted by his admirers, that Mr Churchill was a better poet than Pope. This exaggerated adulation, as it had before corrupted his morals, began now to impair his mind: ſeveral ſucceeding pieces were publiſhed, which, being written without effort, are read without pleaſure. His *Gotham*, *Independence*, *The Times*, ſeem merely to have been written by a man who deſired to avail himſelf of the avidity of the public curioſity in his favour, and are rather aimed at the pockets than the hearts of his readers. Mr Churchill died in 1764, of a miliary fever, with which he was ſeized at Boulogne in France, whither he had gone on a viſit to Mr Wilkes. After his death his poems were collected and printed together in two volumes 8vo.

CHURCHING OF WOMEN AFTER CHILD-BIRTH, took its riſe from the Jewiſh rite of purification. In the Greek church it was limited to the 40th day after delivery; but in the weſtern parts of Europe no certain time was obſerved. There is an office in the liturgy for this purpoſe.

CHURCHYARD, a piece of ground adjoining to a church, ſet apart for the interment or burial of the dead.—In the church of Rome they are bleſſed or conſecrated with great ſolemnity. If a churchyard, which has been thus conſecrated, ſhall afterwards be polluted by any indecent action, or profaned by the burial of an infidel, a heretic, an excommunicated or unbaptized perſon, it muſt be *reconciled*; and the ceremony of the reconciliation is performed with the ſame ſolemnity as that of the bleſſing or conſecration.

CHURCHYARD, *Thomas*, a poet who flouriſhed in the reigns of Henry VIII. Edward VI. Queen Mary, and Queen Elizabeth, was born at Shrewſbury; and inherited a fortune, which he ſoon exhauſted in a fruitleſs attendance on the court, by which he only gained the favour of being retained a domeſtic in the family of Lord Surrey; when, by his lordſhip's encouragement, he commenced poet. Upon his patron's death, he betook himſelf to arms; was in many engagements; was frequently wounded, and was twice made priſoner. He publiſhed 12 pieces, which he afterwards printed together in one volume, under the title of *Churchyard's Chips*; and alſo the tragedy of Thomas Moubray duke of Norfolk. He died in 1570.

CHURLE, CEORLE, or CARL, in the Saxon times, ſignified a tenant at will, who held of the thanes or nobles on condition of rent and ſervice. They were of two ſorts: one rented the eſtate like our farmers; the other tilled and manured the demeſnes, and were called ploughmen. See CEORLE.

CHURNING, in country affairs, the operation of making butter by agitating milk in a well known veſſel called a *churn*. For accelerating this operation, a correſpondent in the Bath Society Papers recommends a little diſtilled vinegar to be poured into the churn; and the butter will be produced in an hour afterwards. He acknowledges, however, that his experiments have not as yet aſcertained the exact quantity of the acid which is neceſſary to the proper effect, nor the preciſe time of its being mixed with the cream. But he apprehends a table ſpoonful or two to a gallon of cream will be ſufficient; nor would he recommend it to be applied till the cream has undergone ſome conſiderable agitation. His firſt trial was after the churning had been going forward half a day: whether he obſerved the ſame rule afterwards he does not ſay; but all his trials proved ſucceſsful, the butter being uniformly obtained in about an hour after the mixture. See AGRICULTURE and CHEMISTRY *Index*.

CHUS, or *Chuſch*, (Bible). It is a tradition of an ancient ſtanding, that the *Chus* of the Scriptures denotes *Ethiopia*, and *Chuſchi* an *Ethiopian*: the Septuagint and Vulgate conſtantly tranſlate it ſo; and in this they are followed by moſt interpreters, and by Joſephus and Jerome. And yet what Bochart urges to the contrary is of no inconſiderable weight, from Ezekiel xxix. 10. in which the two oppoſite extremes of Egypt are deſigned; and therefore *Chus*, which is oppoſite to Syene, muſt be Arabia: but this is more ſtrongly pointed out by Xenophon, by whom Ethiopia is ſaid to be the ſouth boundary of Cyrus's empire; and Herodotus diſtinguiſhes between the Ethiopians of Aſia and Africa, conjoining the former with the Arabians.

CHYLE, in the animal economy, a milky fluid ſecreted from the aliments by means of digeſtion. See ANATOMY and CHEMISTRY *Index*.

CHYLIFICATION, the formation of the chyle, or the act whereby the food is changed into chyle.

The chyle has by ſome authors been thought to have a great reſemblance in its nature and chemical analyſis to milk. The ſubject, however, hath as yet been but little inquired into. See the article MILK.

CHYME, or CHYMUS, in the common ſignification of the word, denotes every kind of humour which is incraſſated by concoction; under which notion it comprehends all the humours fit or unfit for preſerving and nouriſhing the body, whether good or bad. It frequently imports the fineſt parts of the chyle, when ſeparated from the fæces, and contained in the lacteal and thoracic duct.

CHYMISTRY. See CHEMISTRY.

CHYMOLOGI, an appellation given to ſuch naturaliſts as have employed their time in inveſtigating the properties of plants from their taſte and ſmell.

CHYMOSIS, in *Medicine*, the act of making or preparing chyme. The word comes from *χυμος*, *ſuccus*, of *χεω*, *fundo*, "I pour out." Chymoſis, according to ſome, is the ſecond of the concoctions made in the body; being a repeated preparation of the moſt impure and groſs parts of the chyle, which being rejected by the lacteals, is imbibed by the meſeraics, and thence carried to the liver, to be there elaborated, purified, and ſubtilized afreſh. It is of this, according to Rogers, that the animal ſpirits are formed.

CHYMOSIS is alſo a diſtortion of the eye-lids, ariſing from an inflammation; alſo an inflammation of the tunica cornea in the eye.

CHYTLA, in antiquity, a liquor made of wine and oil, and ſometimes uſed in divination.

CHYTRI, among the Athenians, a feſtival in honour of Bacchus and Mercury, kept on the 13th of the month Antheſterion.

CHYTRIUM, in *Ancient Geography*, a place in Ionia, in which formerly ſtood Clazomene; the Clazomenians, through fear of the Perſians, removing from the continent to an adjacent iſland (Pauſanias). Alexander reduced the iſland, by a mole or cauſeway, to a peninſula.

CHYTRUS, in *Ancient Geography*, an inland town of Cyprus, to the north of Citium; famous for its excellent honey.

CIANUS SINUS, in *Ancient Geography*, a bay of Bithynia, named from the town and river Cius.

CIBALÆ, or CIBALIS, in *Ancient Geography*, a town of Pannonia Inferior, on an eminence, near the lake Hiulka, to the north-weſt of Sirmium; the country of the emperor Gratian, where he was brought up to rope-making: a place rendered famous for the ſurpriſal and defeat of Licinius by Conſtantine.

CIBBER, COLLEY, a celebrated comedian, dramatic writer, and poet-laureat to the king, was born at London in 1671. His father Caius Gabriel Cibber, was a native of Holſtein, and a ſkilful ſtatuary, who executed the baſſo relievo on the pedeſtal of the monument, and the two admired figures of lunatics over the piers of the gate to Bethlehem Hoſpital in Moorfields. Colley, who derived his Chriſtian name from the ſurname of his mother's family, was intended for the church, but betook himſelf to the ſtage, for which he conceived an early inclination; and he was ſome time before he acquired any degree of notice, or even a competent ſalary. His firſt eſſay in writing, was the comedy of *Love's laſt Shift*, acted in 1695, which met with ſucceſs; as did his own performance of the character of the fop in it. From that time, as he ſays himſelf, "My muſe and my ſpouſe were ſo equally prolific, that the one was ſeldom the mother of a child, but in the ſame year the other made me the father of a play. I think we had a dozen of each ſort between us; of both which kinds ſome died in their infancy, and near an equal number of each were alive when we quitted the theatre." The *Careleſs Huſband*, acted in 1704, met with great applauſe, and is reckoned his beſt play; but none was of more importance to him than the *Non-juror*, acted in 1717, and levelled againſt the Jacobites. This laid the foundation of the miſunderſtanding between him and Mr Pope, raiſed him to be the hero of the Dunciad, and made him poet-laureat in 1730. He then quitted the ſtage, except a few occaſional performances; and died in 1757. Cibber neither ſucceeded in writing nor in acting tragedy; and his odes were not thought to partake of the genius or ſpirit he ſhowed in his comedies.

His ſon *Theophilus*, alſo a comic actor after him, was born during a great ſtorm in 1703; and after paſſing a life of extravagance, diſtreſs, and perplexity, periſhed in another ſtorm in 1758, in the paſſage between Dublin and England. Theophilus married the ſiſter of Thomas Auguſtine Arne, the famous muſical compoſer; who became a celebrated tragic actreſs, and whoſe honour was ſacrificed to her huſband's extravagance.

CIBDELOPLACIA, in *Natural Hiſtory*; a genus of ſpars debaſed by a very large admixture of earth: they are opaque, formed of thin cruſts, covering vegetables and other bodies, by way of incruſtations.

Of this genus we have the following ſpecies: 1. A grayiſh-white one, with a rough ſurface. 2. A whitiſh brown one: both theſe are friable. 3. A hard, pale-brown kind, which is the oſteocolla of the ſhops. 4. The whitiſh-gray kind, with a ſmooth ſurface: this is the unicornu foſſil and ceratites of authors. 5. The whitiſh-brown corralloide kind.

CIBDELOSTRACIA, in *Natural Hiſtory*, terrene ſpars, deſtitute of all brightneſs and tranſparency, formed into thin plates, and uſually found coating over the ſides of fiſſures, and other cavities of ſtones, with congeries of them to great extent, and of plain or botroyide ſurfaces.

Of theſe there are uſually reckoned ſeven kinds: the firſt the hard, browniſh-white cibdeloſtracium, found in Germany: the ſecond is the hard, whitiſh cibdeloſtracium, with thin cruſts, and a ſmoother ſurface, found alſo in the Harts-foreſt in Germany: the third is the hard, pale-brown cibdeloſtracium, with numerous very thin cruſts, found in ſubterranean caverns in many parts of England as well as Germany: the fourth is the white, light, and friable cibdeloſtracium, found alſo in Germany, but very rarely in any part of England: the fifth is the light, hard, pale-brown cibdeloſtracium, with a ſmooth ſurface, found in almoſt all parts of the world: the ſixth is the whitiſh, friable, cruſtaceous cibdeloſtracium, with a rougher ſurface, frequent in Germany and England; and the ſeventh is the browniſh-white friable cibdeloſtracium, with a duſky ſurface, found in ſeveral parts of Ireland as well as Germany.

CIBORIA, in antiquity, the large huſks of Egyptian beans, which are ſaid to have been ſo large as to ſerve for drinking-cups: whence they had their name *ciborium*, ſignifying a cup, in the Egyptian language.

CIBORIUM, in eccleſiaſtical writers, the covering for the altar. This covering is ſupported by four high columns, and forms a kind of tent for the euchariſt, in the Romiſh churches. Some authors call it *turris geſtatoria*, and others *pyxis*; but the pyxis is properly the box in which the euchariſt is preſerved.

CIBUS FERIALIS, in antiquity, an entertainment peculiar to a funeral; for which purpoſe, beans, parſley, lettuce, bread, eggs, lentils, and ſalts, were in uſe.

CICADA, the FROG-HOPPER or FLEA-LOCUST, a genus of inſects belonging to the order of hemiptera. See ENTOMOLOGY *Index*.

CICATRICULA, among natural hiſtorians, denotes a ſmall whitiſh ſpeck in the yolk of an egg, ſuppoſed to be the firſt rudiments of the future chick.

CICATRIX, in *Surgery*, a little ſeam or elevation of callous fleſh riſing on the ſkin, and remaining there after the healing of a wound or ulcer. It is commonly called a *ſcar*.

CICATRIZANTS, in *Pharmacy*, medicines which aſſiſt nature to form a cicatrix. Such are Armenian bole, powder of tutty, &c.

Cicatrizants are otherwiſe called *eſcharotics*, *epulotics*, *incarnatives*, *agglutinants*, &c.

CICCA, in *Botany*, a genus of the tetrandria order, belonging to the monœcia claſs of plants. The male calyx is tetraphyllous; there is no corolla: the female calyx triphyllous; no corolla; four ſtiles; the capſule quaddricoccous or four-berried.

CICELY, in *Botany*, the Engliſh name of a ſpecies of chærophyllum. See CHÆROPHYLLUM, BOTANY *Index*.

CICER, or CHICK-PEA. See BOTANY *Index*.

CICERO, MARCUS TULLIUS, the celebrated Roman orator, was born in the year of Rome 647, about 105 years before Chriſt. His father Marcus Tullius, who was of the equeſtrian order, took great care of his education, which was directed particularly with a view to the bar. Young Tully, at his firſt appearance in public, declaimed with ſuch vehemence againſt Sylla's party, that it became expedient for him to retire into Greece; where he heard the Athenian orators and philoſophers, and greatly improved both in eloquence and knowledge. Here he met with T. Pomponius, who had been his ſchool-fellow; and who, from his love to Athens, and ſpending a great part of his days in it, obtained the ſurname of *Atticus*; and here they revived and confirmed that noted friendſhip which ſubſiſted between them through life with ſo celebrated a conſtancy and affection. From Athens he paſſed into Aſia; and after an excurſion of two years came back again into Italy.

Cicero was now arrived at Rome; and, after one year more ſpent at the bar, obtained, in the next place, the dignity of queſtor. Among the cauſes which he pleaded before his queſtorſhip, was that of the famous comedian Roſcius, whom a ſingular merit in his art had recommended to the familiarity and friendſhip of the greateſt men in Rome. The queſtors were the general receivers or treaſurers of the republic, and were ſent annually into the provinces diſtributed to them, as they always were, by lot. The iſland of Sicily happened to fall to Cicero's ſhare; and that part of it, for it was conſiderable enough to be divided into two provinces, which was called *Lilybæum*. This office he received, not as a gift, but a truſt; and he acquitted himſelf ſo well in it, that he gained the love and admiration of all the Sicilians. Before he left Sicily, he made the tour of the iſland, to ſee every thing that was curious, and eſpecially the city of Syracuſe; where he diſcovered the tomb of Archimedes to the magiſtrates who were ſhowing him the curioſities of the place, but who, to his ſurpriſe, knew nothing of any ſuch tomb.

We have no account of the preciſe time of Cicero's marriage with Terentia; but it is ſuppoſed to have been celebrated immediately after his return from his travels to Italy, when he was about 30 years old. He was now diſengaged from his queſtorſhip in Sicily, by which firſt ſtep, in the legal gradation and aſcent of public honours, he gained an immediate right to the ſenate, and an actual admiſſion into it during life; and ſettled again in Rome, where he employed himſelf conſtantly in defending the perſons and properties of its citizens, and was indeed a general patron. Five years were almoſt elapſed ſince Cicero's election to the queſtorſhip, which was the proper interval preſcribed by law before he could hold the next office of ædile; to which he was now, in his 37th year, elected by the unanimous ſuffrages of all the tribes, and preferably to all his competitors. After Cicero's election to the ædileſhip, but before his entrance upon the office, he undertook the famed proſecution of C. Verres, the late prætor of Sicily, who was charged with many flagrant acts of injuſtice, rapine, and cruelty, during his triennial government of that iſland. This was one of the moſt memorable tranſactions of his life, for which he was greatly and juſtly celebrated by antiquity, and for which he will, in all ages, be admired and eſteemed by the friends of mankind. The reſult was, that, by his diligence and addreſs, he ſo confounded Hortenſius, though the reigning orator at the bar, and uſually ſtyled *the king of the forum*, that he had nothing to ſay for his client. Verres, deſpairing of all defence, ſubmitted immediately, without expecting the ſentence, to a voluntary exile; where he lived many years, forgotten and deſerted by all his friends. He is ſaid to have been relieved in this miſerable ſituation by the generoſity of Cicero; yet was proſcribed and murdered after all by Mark Antony, for the ſake of thoſe fine ſtatues and Corinthian veſſels of which he had plundered the Sicilians.

After the uſual interval of two years from the time of his being choſen ædile, Cicero offered himſelf a candidate for the prætorſhip; and, in three different aſſemblies convened for the choice of prætors, two of which were diſſolved without effect, he was declared every time the firſt prætor by the ſuffrages of all the centuries. He was now in the career of his fortunes, and in ſight, as it were, of the conſulſhip, the grand object of his ambition; and therefore, when his prætorſhip was at an end, he would not accept any foreign province, the uſual reward of that magiſtracy, and the chief fruit which the generality propoſed from it. He had no particular love for money, nor genius for arms; ſo that thoſe governments had no charms for him: the glory which he purſued was to ſhine in the eyes of the city as the guardian of its laws, and to teach the magiſtrates how to execute, and the citizens how to obey, them.

Being now in his 43d year, the proper age required by law, he declared himſelf a candidate for the conſulſhip along with ſix competitors, L. Sulpicius Galba, L. Sergius Catilina, C. Antonius, L. Caſſius Longinus, Q. Cornificius, and C. Licinius Sacerdos. The two firſt were patricians; the two next plebeians, yet noble; the two laſt the ſons of fathers who had firſt imported the public honours into their families: Cicero was the only *new man*, as he was called, among them, or one of the equeſtrian rank. Theſe were the competitors; and in this competition the practice of bribing was carried on as openly and as ſhamefully by Antonius and Catiline as it uſually is at our elections in Britain. However, as the election approached, Cicero's intereſt appeared to be ſuperior to that of all the candidates: for the nobles themſelves, though always envious and deſirous to depreſs him, yet out of regard to the dangers which threatened the city from many quarters, and ſeemed ready to burſt out into a flame, began to think him the only man qualified to preſerve the republic, and break the cabals of the deſperate by the vigour and prudence of his adminiſtration. The method of chooſing conſuls was not by an open vote, but by a kind of ballot, or little tickets of wood diſtributed to the citizens, with the names of the ſeveral candidates inſcribed upon each; but in Cicero's caſe the people were not content with this ſecret and ſilent way; but before they came to any ſcrutiny, loudly and univerſally proclaimed Cicero the firſt conſul, ſo that, as he himſelf ſays, "he was not choſen by the votes of particular citizens, but the common ſuffrage of the city; nor declared by the voice of the crier, but of the whole Roman people."

Cicero had no ſooner entered upon his office than he had occaſion to exert himſelf againſt P. Servilius Rullus, one of the new tribunes, who had been alarming the ſenate with the promulgation of an agrarian law; the purpoſe of which was to create a decemvirate, or ten commiſſioners, with abſolute power for five years over all the revenues of the republic, to diſtribute them at pleaſure to the citizens, &c. Theſe laws uſed to be greedily received by the populace, and were propoſed therefore by factious magiſtrates as oft as they had any point to carry with the multitude againſt the public good; ſo that Cicero's firſt buſineſs was to quiet the apprehenſions of the city, and to baffle, if poſſible, the intrigues of the tribune. Accordingly, in an artful and elegant ſpeech from the roſtra, he gave ſuch a turn to the inclination of the people, that they rejected this law with as much eagerneſs as they had ever received one. But the grand affair of all, which conſtituted the glory of his conſulſhip, and has tranſmitted his name with ſuch luſtre to poſterity, was the ſkill he ſhowed, and the unwearied pains he took, in ſuppreſſing that horrid conſpiracy which was formed by Catiline and his accomplices for the ſubverſion of the commonwealth. For this great ſervice he was honoured with the glorious title of *pater patriæ*, "the father of his country," which he retained for a long time after.

Cicero's adminiſtration was now at an end; but he had no ſooner quitted his office, than he began to feel the weight of that envy which is the certain fruit of illuſtrious merit. He was now, therefore, the common mark, not only of all the factious, againſt whom he had declared perpetual war, but of another party not leſs dangerous, the envious too, whoſe united ſpleen never left him from this moment till they had driven him out of that city which he had ſo lately preſerved. Cicero, upon the expiration of his conſulſhip, took care to ſend a particular account of his whole adminiſtration to Pompey, who was finiſhing the Mithridatic war in Aſia, in hopes to prevent any wrong impreſſions there from the calumnies of his enemies, and to draw from him ſome public declaration in praiſe of what he had been doing. But Pompey being informed by Metellus and Cæſar of the ill humour that was riſing againſt Cicero in Rome, anſwered him with great coldneſs, and inſtead of paying him any compliment, took no notice at all of what had paſſed in the affair of Catiline, upon which Cicero expoſtulates with him in a letter which is ſtill extant.

About this time Cicero bought a houſe of M. Craſſus on the Palatine-hill, adjoining to that in which he had always lived with his father, and which he is now ſuppoſed to have given up to his brother Quintius. The houſe coſt him near 30,000l. and ſeems to have been one of the nobleſt in Rome. It was built about 30 years before by the famous tribune M. Livius Druſus; on which occaſion we are told, that when the architect promiſed to build it for him in ſuch a manner that none of his neighbours ſhould overlook him; "But if you have any ſkill (replied Druſus), contrive it rather ſo that all the world may ſee what I am doing." The purchaſe of ſo expenſive a houſe raiſed ſome cenſure on his vanity; and eſpecially as it was made with borrowed money. This circumſtance he himſelf does not diſſemble, but ſays merrily upon it, that "he was now plunged ſo deeply in debt, as to be ready for a plot, only that the conſpirators would not truſt him."

The moſt remarkable event that happened in this year, which was the 45th of Cicero's life, was the pollution of the myſteries of the *bona dea* by P. Clodius, which, by an unhappy train of conſequences, involved Cicero in a great and unexpected calamity. Clodius had an intrigue with Cæſar's wife Pompeia, who, according to annual cuſtom, was now celebrating in her houſe thoſe awful ſacrifices of the goddeſs, to which no male creature ever was admitted, and where every thing maſculine was ſo ſcrupulouſly excluded, that even pictures of that ſort were covered during the ceremony. It flattered Clodius's imagination greatly to gain acceſs to his miſtreſs in the midſt of her holy miniſtry; and with this view he dreſſed himſelf in a woman's habit, that by the benefit of his ſmooth face, and the introduction of one of the maids, he might paſs without diſcovery; but by ſome miſtake between him and his guide, he loſt his way when he came within the houſe, and fell unluckily among the other female ſervants. Here he was detected by his voice, and the ſervants alarmed the whole company by their ſhrieks, to the great amazement of the matrons, who threw a veil over their ſacred myſteries, while Clodius found means to eſcape. The ſtory was preſently ſpread abroad, and raiſed a general ſcandal and horror throughout the city. The whole defence which Clodius made when, by order of the ſenate, he was brought to a trial, was to prove himſelf abſent at the time of the fact, for which purpoſe he produced two men to ſwear that he was then at Interamna, about two or three days journey from the city. But Cicero being called upon to give his teſtimony, depoſed, that Clodius had been with him that very morning at his houſe in Rome. Irritated by this, Clodius formed a ſcheme of revenge. This was to get himſelf choſen tribune, and in that office to drive Cicero out of the city, by the publication of a law, which, by ſome ſtratagem or other, he hoped to obtrude upon the people. But as all patricians were incapable of the tribunate by its original inſtitution, ſo his firſt ſtep was to make himſelf a plebeian, by the pretence of an adoption into a plebeian houſe, which could not yet be done without the ſuffrage of the people. The firſt triumvirate was now formed, which was nothing elſe in reality but a traitorous conſpiracy of three of the moſt powerful citizens of Rome, to extort from their country by violence what they could not obtain by law. Pompey's chief motive was to get his acts confirmed by Cæſar in his conſulſhip, which was now coming on; Cæſar, by giving way to Pompey's glory, to advance his own; and Craſſus, to gain that aſcendance by the authority of Pompey and Cæſar, which he could not ſuſtain alone. Cicero might have made what terms he pleaſed with the triumvirate, and been admitted even a partner of their power, and a fourth in their league; but he would not enter into any engagements with the three whoſe union he and all the friends of the republic abhorred. Clodius, in the mean time, had been puſhing

ing on the buſineſs of his adoption, which at laſt he effected, and began ſoon after to threaten Cicero with all the terrors of his tribunate, to which he was now advanced without any oppoſition. Both Cæſar and Pompey ſecretly favoured his ſcheme; not that they intended to ruin Cicero, but only to keep him under the laſh; and if they could not draw him into their meaſures, or make him at leaſt keep quiet, to let Clodius looſe upon him. Cæſar, in particular, wanted to diſtreſs him ſo far as to force him to a dependence on himſelf; for which end, while he was privately encouraging Clodius to purſue him, he was propoſing expedients to Cicero for his ſecurity. But though his fortunes ſeemed now to be in a tottering condition, and his enemies to gain ground daily upon him, yet he was unwilling to owe the obligation of his ſafety to any man, far leſs to Cæſar, whoſe deſigns he always ſuſpected, and whoſe ſchemes he never approved. This ſtiffneſs in Cicero ſo exaſperated Cæſar, that he reſolved immediately to aſſiſt Clodius with all his power to oppreſs him; while Pompey was all the time giving him the ſtrongeſt aſſurances that there was no danger, and that he would ſooner be killed himſelf than ſuffer him to be hurt.

Clodius, in the mean time, was obliging the people with ſeveral new laws, contrived chiefly for their advantage; the deſign of all which was only to introduce, with a better grace, the ground-plot of the plan, the baniſhment of Cicero. In ſhort, having cauſed a law to be enacted, importing, that any who had condemned a Roman citizen, unheard, ſhould himſelf be baniſhed, he ſoon after impeached Cicero upon it. It was in vain that this great man went up and down the city ſoliciting his cauſe in the habit of a ſuppliant, and attended by many of the firſt young noblemen whom he had taught the rules of eloquence; thoſe powers of ſpeaking which had ſo often been ſucceſsful in defending the cauſe of others, ſeemed totally to forſake his own: he was baniſhed by the votes of the people 400 miles from Italy; his houſes were ordered to be demoliſhed, and his goods ſet up to ſail. It cannot be denied, that in this great calamity he did not behave himſelf with that firmneſs which might reaſonably be expected from one who had borne ſo glorious a part in the republic; conſcious of his integrity, and ſuffering in the cauſe of his country; for his letters are generally filled with ſuch lamentable expreſſions of grief and deſpair, that his beſt friends, and even his wife, were forced ſometimes to admoniſh him to rouſe his courage, and remember his former character. Atticus was conſtantly putting him in mind of it; and ſent him word of a report that was brought to Rome by one of Caſſius's freed-men, that his affliction had diſordered his ſenſes. He was now indeed attacked in his weakeſt part; the only place in which he was vulnerable. To have been as great in affliction as he was in proſperity, would have been a perfection not given to man; yet his very weakneſs flowed from a ſource which rendered him the more amiable in all the other parts of his life; and the ſame tenderneſs of diſpoſition which made him love his friends, his children, and his country, more paſſionately than other men, made him feel the loſs of them more ſenſibly. When he had been gone a little more than two months, a motion was made in the ſenate by one of the tribunes, who was his friend, to recal him, and repeal the laws of Clodius, to which the whole houſe readily agreed. Many obſtructions, as may be eaſily imagined, were given to it by the Clodian faction; but this made the ſenate only more reſolute to effect it. They paſſed a vote, therefore, that no other buſineſs ſhould be done till Cicero's return was carried; which at laſt it was, and in ſo ſplendid and triumphant a manner, that he had reaſon, he ſays, to fear, leſt people ſhould imagine that he himſelf had contrived his late flight for the ſake of ſo glorious a reſtoration.

Cicero, now in his 50th year, was reſtored to his former dignity, and ſoon after to his former fortunes; ſatisfaction being made to him for the ruin of his eſtates and houſes, which laſt were built up again by himſelf with more magnificence than before. But he had domeſtic grievances about this time which touched him very nearly, and which, as he ſignifies obſcurely to Atticus, were of too delicate a nature to be expreſſed in a letter: They aroſe chiefly from the petulant humour of his wife, which began to give him frequent occaſions of chagrin, and, by a ſeries of repeated provocations, confirmed in him that ſettled diſguſt which at laſt ended in a divorce.

In the 56th year of his age, he was made proconſul of Cilicia, and his adminiſtration there gained him great honour. About this time the expectation of a breach between Cæſar and Pompey engaged the general attention. Craſſus had been deſtroyed with his army ſome years before in the war with the Parthians; and Julia the daughter of Cæſar, whom Pompey married, and who, while ſhe lived, was the cement of their union, was alſo dead in child-bed. Cæſar had put an end to the Gallic war, and reduced the whole province to the Roman yoke; but though his commiſſion was near expiring, he ſeemed to have no thoughts of giving it up and returning to the condition of a private ſubject. He pretended that he could not poſſibly be ſafe if he parted with his army, eſpecially while Pompey held the province of Spain prolonged to him for five years. This diſpoſition to a breach Cicero ſoon learned from his friends, as he was returning from his province of Cilicia. But as he foreſaw the conſequences of a war more clearly and fully than any of them, ſo his firſt reſolution was to apply all his endeavours and authority to the mediation of a peace; though, in the event of a breach, he was determined within himſelf to follow Pompey. He clearly foreſaw, what he declared without ſcruple to his friends, that which ſide ſoever got the better, the war muſt neceſſarily end in a tyranny. The only difference, he ſaid, was, that if their enemies conquered, they ſhould be proſcribed; if their friends, they would be ſlaves.

He no ſooner arrived at the city, however, than he fell, as he tells us, into the very flame of civil diſcord, and found the war in effect proclaimed; for the ſenate had juſt voted a decree, that Cæſar ſhould diſband his army by a certain day, or be declared an enemy; and Cæſar's ſudden march towards Rome effectually confirmed it. In the midſt of all this hurry and confuſion, Cæſar was extremely ſolicitous about Cicero; not ſo much to gain him, for that was not to be expected, as to prevail with him to ſtand neuter. He wrote to him ſeveral times to that effect, and employed all their common friends to preſs him with letters on that ſubject; all which was done; but in vain, for Cicero was impatient to be gone to Pompey. In the mean time, theſe letters give us a moſt ſenſible proof of the high eſteem and credit in which Cicero flouriſhed at this time in Rome; when in a conteſt for empire, which force alone was to decide, we ſee the chiefs on both ſides ſo ſolicitous to gain a man to their party, who had no peculiar ſkill in arms or talents for war. Purſuing, however, the reſult of all his deliberations, he embarked at length to follow Pompey, who had been obliged to quit Italy ſome time before, and was then at Dyrrhachium; and arrived ſafely in his camp with his ſon, his brother, and his nephew, committing the fortunes of the whole family to the iſſue of that cauſe. After the battle of Pharſalia, in which Pompey was defeated, Cicero returned into Italy, and was afterwards received into great favour by Cæſar, who was now declared dictator the ſecond time, and Mark Antony his maſter of horſe. We may eaſily imagine, what we find indeed from his letters, that he was not a little diſconcerted at the thoughts of an interview with Cæſar, and the indignity of offering himſelf to a conqueror againſt whom he had been in arms; for though upon many accounts he had reaſon to expect a kind reception from Cæſar, yet he hardly thought his life, he ſays, worth begging, ſince what was given by a maſter might always be taken away again at pleaſure. But at their meeting he had no occaſion to ſay or do any thing that was below his dignity; for Cæſar no ſooner ſaw him than he alighted, ran to embrace him, and walked with him alone, converſing very familiarly, for ſeveral furlongs.

Cicero was now in his 61ſt year, and forced at laſt to part with his wife Terentia, whoſe humour and conduct had been long uneaſy to him. She was a woman of an imperious and turbulent ſpirit, and though he had borne her perverſeneſs in the vigour of health, and flouriſhing ſtate of his fortunes; yet, in a declining life, ſoured by a continual ſucceſſion of mortifications from abroad, the want of eaſe and quiet at home was no longer tolerable to him. But he was immediately oppreſſed by a new and moſt cruel affliction, the death of his beloved daughter Tullia, who died in child-bed ſoon after her divorce from her third huſband Dolabella. She was about 32 years old at the time of her death; and, by the few hints which are left of her character, appears to have been an excellent and admirable woman. She was moſt affectionately and piouſly obſervant of her father, and, to the uſual graces of her ſex, having added the more ſolid accompliſhments of knowledge and polite letters, was qualified to be the companion and delight of his age; and was juſtly eſteemed, not only as one of the beſt, but the moſt learned, of the Roman ladies. His affliction for the death of this daughter was ſo great, that to ſhun all company as much as he could, he removed to Atticus's houſe, where he lived chiefly in his library, turning over every book he could meet with on the ſubject of moderating grief. But finding his reſidence here too public, and a greater reſort to him than he could bear, he retired to Aſturia, one of his ſeats near Antium; a little iſland on the Latian ſhore, at the mouth of a river of the ſame name, covered with wood and groves cut into ſhady walks; a ſcene of all others the fitteſt to indulge melancholy, and where he could give a free courſe to his grief. "Here (ſays he to Atticus) I live without the ſpeech of man; every morning early I hide myſelf in the thickeſt of the wood, and never come out till the evening. Next to yourſelf, nothing is ſo dear to me as this ſolitude; and my whole converſation is with my books." Indeed his whole time was employed in little elſe than reading and writing during Cæſar's adminiſtration, which he could never cheerfully ſubmit to; and it was within this period that he drew up one of the graveſt of thoſe philoſophical pieces which are ſtill extant in his works.

Upon the death of Cæſar, Octavius his nephew and heir coming into Italy, was preſented to Cicero by Hirtius and Panſa, with the ſtrongeſt profeſſions on the part of the young man that he would be governed entirely by his direction. Indeed Cicero thought it neceſſary to cheriſh and encourage Octavius, if for nothing elſe, yet to keep him at a diſtance from Antony; but could not yet be perſuaded to enter heartily into his affairs. He ſuſpected his youth and want of experience; and that he had not ſtrength enough to deal with Antony; and, above all, that he had no good diſpoſition towards the conſpirators. He thought it impoſſible he ſhould ever be a friend to them; and was perſuaded rather, that if ever he got the upper hand, his uncle's acts would be more violently enforced, and his death more cruelly revenged, than by Antony himſelf. And when Cicero did conſent at laſt to unite himſelf to Octavius's intereſts, it was with no other view but to arm him with a power ſufficient to oppreſs Antony; yet ſo checked and limited, that he ſhould not be able to oppreſs the republic.

In the hurry of all theſe politics, he was ſtill proſecuting his ſtudies with his uſual application; and, beſides ſome philoſophical pieces, now finiſhed his book of offices, or the duties of man, for the uſe of his ſon: A work admired by all ſucceeding ages as the moſt perfect ſyſtem of Heathen morality, and the nobleſt effort and ſpecimen of what reaſon could do in guiding man through life with innocence and happineſs. However, he paid a conſtant attention to public affairs; miſſed no opportunities, but did every thing that human prudence could do for the recovery of the republic: for all that vigour with which it was making this laſt effort for itſelf, was entirely owing to his counſels and authority. This appears from thoſe memorable Philippics which from time to time he publiſhed againſt Antony, as well as from other monuments of antiquity. But all was in vain; for though Antony's army was entirely defeated at the ſiege of Modena, which made many people imagine that the war was at an end, and the liberty of Rome eſtabliſhed; yet the death of the conſuls Panſa and Hirtius in that action gave the fatal blow to all Cicero's ſchemes, and was the immediate cauſe of the ruin of the republic.

Octavius having ſubdued the ſenate to his mind, marched towards Gaul to meet Antony and Lepidus; who had already paſſed the Alps, and brought their armies into Italy, in order to have a perſonal interview with him; which had been privately concerted for ſettling the terms of a triple league, and dividing the power and provinces of Italy among themſelves,

themſelves. The place appointed for this interview was a ſmall iſland about two miles from Bononia, formed by the river Rhenus which runs near that city. Here they met, and ſpent three days in a cloſe conference to adjuſt the plan of their accommodation; and the laſt thing they adjuſted was the liſt of a proſcription which they were determined to make of their enemies. This, as the writers tell us, occaſioned much difficulty and warm conteſts among them, till each in his turn conſented to ſacrifice ſome of his beſt friends to the revenge and reſentment of his colleagues. Cicero was at his Tuſculan villa, when he firſt received the news of the proſcription, and of his being included in it. It was the deſign of the triumvirate to keep it a ſecret, if poſſible, to the moment of execution, in order to ſurpriſe thoſe whom they had deſtined to deſtruction, before they were aware of their danger, or had time to make their eſcape. But ſome of Cicero's friends found means to give him early notice of it; upon which he ſet forward to the ſea-ſide, with a deſign to tranſport himſelf out of the reach of his enemies. There, finding a veſſel ready, he preſently embarked; but the winds being adverſe, and the ſea uneaſy to him, after he had ſailed about two leagues along the coaſt, he was obliged to land, and ſpend the night on ſhore. From whence he was forced, by the importunity of his ſervants, on board again; but was ſoon afterwards obliged to land at a country-ſeat of his a mile from the ſhore, weary of life, and declaring he was reſolved to die in that country which he had ſo often ſaved. Here he ſlept ſoundly for ſome time, till his ſervants once more forced him away in a litter towards the ſhip. having heard that he was purſued by Antony's aſſaſſins. They were ſcarce departed when the aſſaſſins arrived at his houſe; and, perceiving him to be fled, purſued him immediately towards the ſea, and overtook him in a wood that was near the ſhore. Their leader was one Popilius Lenas, a tribune of the army, whoſe life Cicero had formerly defended and ſaved. As ſoon as the ſoldiers appeared, the ſervants prepared to defend their maſter's life at the hazard of their own; but Cicero commanded them to ſet him down and make no reſiſtance. They ſoon cut off his head and his hands, returning with them to Rome as the moſt agreeable preſent to their cruel employer. Antony, who was then at Rome, received them with extreme joy, rewarding the murderer with a large ſum of money, and ordered the head to be fixed upon the roſtra between the two hands; a ſad ſpectacle to the city, and what drew tears from every eye, to ſee thoſe mangled members which uſed to exert themſelves ſo gloriouſly from that place in defence of the lives, the fortunes, and the liberties of the Roman people, ſo lamentably expoſed to the ſcorn of ſycophants and traitors. The deaths of the reſt, ſays an hiſtorian of that age, cauſed only a private and particular ſorrow; but Cicero's an univerſal one. It was a triumph over the republic itſelf; and ſeemed to confirm and eſtabliſh the perpetual ſlavery of Rome.

A modern writer *, however, is of opinion, that "poſterity has been too much ſeduced by the name of Cicero, and that better citizens were ſacrificed to the jealouſy of the triumvirs without exciting ſo much indignation. If we take an impartial ſurvey of Cicero's conduct and principles, avowed in his own epiſtolary correſpondence, and trace him through all the labyrinths of his contradictory letters, we ſhall find more to blame than to admire; and diſcover, that the deſire of advancing his fortunes, and make himſelf a name, were, from his outſet in life, the only objects he had in view. The good of his country, and the dictates of ſtern ſteady virtue, were not, as in Brutus and Cato, the conſtant ſprings of his actions. The misfortunes that befel him after his conſulſhip, developed his character, and ſhowed him in his true colours; from that time to his death, puſillanimity, irreſolution, and unworthy repining, tainted his judgment, and perplexed every ſtep he wiſhed to take. He flattered Pompey and cringed to Cæſar, while in his private letters he abuſed them both alternately. He acknowledges in a letter to his friend, the time-ſerving Atticus, that, although he was at preſent determined to ſupport the cauſe of Rome and liberty, and to bear misfortune like a philoſopher, there was one thing which would gain him over to the triumvirs, and that was their procuring for him the vacant augurſhip; ſo pitiful was the bribe to which he would have ſacrificed his honour, his opinion, and the commonwealth. By his wavering imprudent conduct, he contributed greatly towards its deſtruction. After reproaching the conſpirators for leaving him out of the ſecret, and loading them with the moſt flattering compliments on their delivering Rome from Cæſar's tyranny, he calls Caſca an *aſſaſſin*, to pay his court to the boy Octavius, by whom he was completely duped. His praiſes of this triumvir are in the higheſt ſtrain of panegyric. Mark Antony well knew, that the virulent abuſe which Cicero was continually pouring out againſt him, was not an effuſion of patriotic zeal or virtuous indignation, but merely the ebullitions of perſonal hatred. He therefore cauſed Cicero to be killed, as an angry man that has been ſtung, ſtamps on a venomous animal that comes within reach of his foot. The cloak he threw over the body of Brutus, and the ſpeech he pronounced at the ſight of that hero when dead, differ widely from the treatment he gave the remains of Cicero; and ſhow, that he made a diſtinction between a Roman who oppoſed him from political motives, and one whoſe enmity aroſe from private pique.

Cicero's death happened on the 7th of December, in the 64th year of his age, about ten days from the ſettlement of the firſt triumvirate; and with him expired the ſhort empire of eloquence among the Romans. As an orator he is thus characterized by Dr Blair, "In all his orations his art is conſpicuous. He begins commonly with a regular exordium, and with much addreſs prepoſſeſſes the hearers, and ſtudies to gain their affections. His method is clear, and his arguments are arranged with exact propriety. In a ſuperior clearneſs of method, he has an advantage over Demoſthenes. Every thing appears in its proper place. He never tries to move till he has attempted to convince; and in moving, particularly the ſofter paſſions, he is highly ſucceſsful. No one ever knew the force of words better than Cicero. He rolls them along with the greateſt beauty and magnificence; and in the ſtructure of his ſentences is eminently curious and exact. He is always full and flowing, never abrupt. He amplifies every thing; yet though his manner is generally diffuſe, it is often happily varied and accommodated to the ſubject. When

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* *Swinburn's Travels in Sicily*, vol. ii. p. 522.

an important public object rouſed his mind, and demanded indignation and force, he departs conſiderably from that looſe and declamatory manner to which he at other times is addicted, and becomes very forcible and vehement. This great orator, however, is not without his defects. In moſt of his orations there is too much art, even carried to a degree of oſtentation. He ſeems often deſirous of obtaining admiration rather than of operating conviction. He is ſometimes, therefore, ſhowy rather than ſolid, and diffuſe where he ought to have been urgent. His ſentences are always round and ſonorous. They cannot be accuſed of monotony, ſince they poſſeſs variety of cadence; but from too great a fondneſs for magnificence, he is on ſome occaſions deficient in ſtrength. Though the ſervices which he had performed to his country were very conſiderable, yet he is too much his own panegyriſt. Ancient manners, which impoſed fewer reſtaints on the ſide of decorum, may in ſome degree excuſe, but cannot entirely juſtify, his vanity."

CICHORIUM, ſuccory. See BOTANY *Index*.

CICINDELA, the SPARKLER, in *Zoology*, a genus of inſects belonging to the order of coleoptera. See ENTOMOLOGY *Index*.

CICISBEO, an Italian term, which in its etymology ſignifies a *whiſperer*; a term beſtowed in Italy both on lovers, and thoſe who to outward appearance act as ſuch, waiting on married ladies with as much attention and reſpect as if they were their lovers. This Italian cuſtom has been ſpoken of very reproachfully by ſome writers: Mr Baretti has taken great pains to vindicate it. He aſcribes it to a ſpirit of gallantry, derived from the ages of chivalry, and much heightened and refined by the revival of the Platonic philoſophy in Italy, about the thirteenth century; and by the verſes of Petrarch in compliment to the beautiful Laura, and his numerous imitators.

CICLUT, or CICLUCH, a ſtrong frontier town of Dalmatia, ſituated on the river Narentha, in E. Long. 18. 22. N. Lat. 43. 29. It is ſurrounded with walls built in the ancient manner, and was taken by the Venetians from the Turks in 1694.

CICONES, a people of Thrace near the Hebrus. Ulyſſes at his return from Troy conquered them, and plundered their chief city Iſmarus. They tore to pieces Orpheus for his obſcene indulgencies.

CICUTA, properly ſignifies a hollow intercepted between two knots, of the ſtalks or reeds of which the ancient ſhepherds uſed to make their pipes. It is now, however, generally uſed to ſignify the water-hemlock, and alſo the common ſort; but Linnæus has deſcribed the latter under the old name of CONIUM. See that article.

There are three ſpecies of water-hemlock; the viroſa, the bulbifera, and the maculata. Of theſe the firſt is the only one remarkable, and that for the poiſonous qualities of its roots, which have been often known to deſtroy children who ate them for parſnips.

CICUTA is alſo uſed, chiefly among the ancients, for the juice or liquor expreſſed from the above plant, being the common poiſon wherewith the ſtate criminals at Athens were put to death: Though ſome have ſuggeſted, that the poiſonous draught to which the Athenians doomed their criminals was an inſpiſſated juice compounded of the juice of *cicuta* and ſome other corroſive herbs.

Socrates drank the *cicuta*.—Plato, in his dialogue on the immortality of the ſoul, obſerves, that "The executioner adviſed Socrates not to talk, for fear of cauſing the *cicuta* to operate too ſlowly." M. Petit, in his *Obſervationes Miſcellaneæ*, remarks, that this advice was not given by the executioner out of humanity, but to ſave the *cicuta*; for he was only allowed ſo much poiſon per ann. which, if he exceeded, he was to furniſh at his own expence. This conſtruction is confirmed by a paſſage in Plutarch: the executioner who adminiſtered the *cicuta* to Phocion, not having enough, Phocion gave him money to buy more; obſerving by the way, "that it was odd enough, that at Athens a man muſt pay for every thing, even for his own death."

CID, RODERIGO DIAS LE, a Caſtilian officer, who was very ſucceſsful againſt the Moors, under Ferdinand II. king of Caſtile; but whoſe name would hardly have been remembered, if Corneille had not made his paſſion for Chimene the ſubject of an admired tragedy, founded on a ſimple but affecting incident. The Cid is deſperately in love with Chimene, daughter of the count de Gomes; but he is at variance with the count, and being challenged by him, kills him in a duel. The conflict between love and honour in the breaſt of Chimene, who at length pardons and marries the Cid, forms the beauty of the piece. He died in 1098.

CIDARIS, in antiquity, the mitre uſed by the Jewiſh high-prieſts. The Rabbins ſay, that the bonnet uſed by prieſts in general was made of a piece of linen cloth 16 yards long, which covered their heads like a helmet or turban; and they allow no other difference between the high-prieſts bonnet and that of other prieſts, than that the one is flatter, and more in the form of a turban; whereas that worn by ordinary prieſts roſe ſomething more in a point.

CIGNANI CARLO, an Italian painter, was born at Bologna in 1628: and was the diſciple of Albani. He was eſteemed by Pope Clement XI. who nominated him prince of the academy of Bologna, and loaded him with favours. Cignani died at Forli in 1719. The cupola of la Madona del Fuoco at Forli, in which he repreſented Paradiſe, is an admirable work. His principal pictures are at Rome, Bologna, and Forli.

CIGOLI, or CIVOLI, the painter. See CIVOLI.

CILIA, the EYE-LASHES. See ANATOMY *Index*.

CILIATED LEAF, among botanical writers, one ſurrounded with parallel filaments ſomewhat like the hairs of the eye-lids.

CILICIA, an ancient kingdom of Aſia, lying between the 36th and 40th degree of north latitude: bounded on the eaſt by Syria, or rather by Mount Amanus, which ſeparates it from that kingdom; by Pamphylia on the weſt; by Iſauria, Cappadocia, and Armenia Minor, on the north; and by the Mediterranean ſea on the ſouth. It is ſo ſurrounded by ſteep and craggy mountains, chiefly Taurus and Amanus, that it may be defended by a handful of reſolute men againſt a numerous army, there being but three narrow paſſes leading into it, commonly called *Pylæ Ciliciæ*, or the gates of Cilicia; one on the ſide of Cappadocia,

padocia, called the *Paſs of Mount Taurus;* and the other two called the *Paſs of Mount Amanus*, and the *Paſs of Syria*. The whole country was divided by the ancients into Cilicia Aſpera, and Cilicia Campeſtris; the former called by the Greeks *Trachæa* or *Stony*, from its abounding ſo with ſtones; and to this day the whole province is called by the Turks, *Tas Wileieth*, or *the Stony Province*.

According to Joſephus, Cilicia was firſt peopled by Tarſhiſh the ſon of Javan, and his deſcendants, whence the whole country was named *Tarſus*. The ancient inhabitants were in proceſs of time driven out by a colony of Phœnicians, who under the conduct of *Cilix*, firſt ſettled in the iſland of Cyprus, and from thence paſſed into the country which, from the leader, they called *Cilicia*. Afterwards ſeveral other colonies from different nations ſettled in this kingdom, particularly from Syria and Greece; whence the Cilicians in ſome places uſed the Greek tongue, in others the Syriac; but the former greatly corrupted by the Perſian, the predominant language of the country being a dialect of that tongue. We find no mention of the kings of Cilicia after their ſettlement in that country, till the time of Cyrus, to whom they voluntarily ſubmitted, continuing ſubject to the Perſians till the overthrow of that empire; but governed to the time of Artaxerxes Mnemon, by kings of their own nation. After the downfal of the Perſian empire, Cilicia became a province of that of Macedon; and, on the death of Alexander, fell to the ſhare of Seleucus, and continued under his deſcendants till it was reduced to a Roman province by Pompey. As a proconſular province, it was firſt governed by Appius Claudius Pulcher, and after him by Cicero, who reduced ſeveral ſtrong holds on Mount Amanus, in which ſome Cicilians had fortified themſelves, and held out againſt his predeceſſor. It was on this occaſion that the diviſion, formerly mentioned, into Trachæa and Campeſtris, took place. The latter became a Roman province; but the former was governed by kings appointed by the Romans, till the reign of Veſpaſian, when the family of Tracondementus being extinct, this part alſo made a province of the empire, and the whole divided into Cilicia *Prima*, Cilicia *Secunda*, and Iſauria; the firſt took in all Cilicia Campeſtris, the ſecond the coaſt of Cilicia Trachæa, and the laſt the inland parts of the ſame diviſion. It is now a province of Aſiatic Turkey; and is called *Caramania*, having been the laſt province of the Caramanian kingdom which held out againſt the Ottoman race.

That part of Cilicia called by the ancients *Cilicia Campeſtris*, was, if we believe Ammianus Marcellinus, one of the moſt fruitful countries of Aſia; but the weſtern part equally barren, though famous, even to this day, for an excellent breed of horſes, of which 600 are yearly ſent to Conſtantinople for the ſpecial uſe of the Grand Signior. The air in the inland parts is reckoned wholeſome; but that on the ſea-coaſt very dangerous, eſpecially to ſtrangers.

The rivers of any note are the Pyramus, which riſes on the north ſide of Mount Taurus, and empties itſelf into the Mediterranean between Iſſus and Magaraſſus; and the Cydnus, which ſprings from the Antitaurus, paſſes through Tarſus, and diſembogues itſelf into the Mediterranean. This laſt is famous for the rapidity of its ſtream, and the coldneſs of its waters, which proved very dangerous to Alexander the Great.

The Cilicians, if we believe the Greek and Roman hiſtorians, were a rough unpoliſhed race of people, unfair in their dealings, cruel, and liars even to a proverb. In the Roman times they became greatly addicted to piracy. They firſt began, in the time of the Mithridatic war, to infeſt the neighbouring provinces along with the Pamphylians; and, being emboldened with ſucceſs, they ſoon ventured as far as the coaſts of Greece and Italy, where they took a vaſt number of ſlaves, whom they ſold to the Cypriots and the kings of Egypt and Syria. They were, however, at laſt defeated and entirely ſuppreſſed by Pompey the Great. See *(Hiſtory of)* ROME.

CILICIA *Terra*, in the natural hiſtory of the ancients, a bituminous ſubſtance improperly called an earth, which, by boiling, became tough like bird-lime, and was uſed inſtead of that ſubſtance to cover the ſtocks of the vines for preſerving them from the worms. It probably ſerved in this office in a ſort of double capacity, driving away theſe animals by its nauſeous ſmell, and entangling them if they chanced to get amongſt it.

CILICIUM, in Hebrew antiquity, a ſort of habit made of coarſe ſtuff, formerly in uſe among the Jews in times of mourning and diſtreſs. It is the ſame with what the Septuagint and Hebrew verſions called ſackcloth.

CILLEY, an ancient and famous town of Germany, in the circle of Auſtria, and in Stiria. It is the capital of a county of the ſame name, and is ſituated on the river Saan, in E. Long. 15. 15. N. Lat. 46. 31.

CILURNUM, (Notitia); a town of Britain: thought to be Collerton, or Collerford, in Northumberland; but Walwic, or Scilicester, according to Camben.

CIMA, or SIMA, in *Architecture*, the ſame with Cymatium, or OGEE.

CIMABUE, GIOVANI, a renowned painter, born at Florence in 1240, and the firſt who revived the art of painting in Italy. He painted, according to the cuſtom of thoſe times, in freſco and in diſtemper; colours in oil not being then found out. He excelled in architecture as well as in painting; and was concerned in the fabric of Sancta Maria del Fior at Florence, during which employment he died at the age of 60, and left many diſciples.

CIMBRI, an ancient Celtic nation, inhabiting the northern parts of Germany. They are ſaid to have been deſcended from the Aſiatic *Cimmerians*, and to have taken the name of *Cimbri* when they changed their old habitations. When they firſt became remarkable, they inhabited chiefly the peninſula now called *Jutland*, and by the ancients *Cimbrica Cherſoneſus*. About 113 years before Chriſt, they left their peninſula with their wives and children; and joining the Teutones, a neighbouring nation, took their journey ſouthward in queſt of a better country. They firſt fell upon the Boii, a Gauliſh nation ſituated near the Hercynian foreſt. Here they were repulſed, and obliged to move nearer the Roman provinces. The republic being then alarmed at the approach of ſuch multitudes of barbarians, ſent an army againſt them under the conſul Papirius Carbo. On the approach of the Roman army, the Cimbri made propoſals of peace. The conſul pretended to accept of it; but having thrown them into a diſadvantageous ſituation, treacherouſly attacked their camp. His perfidy was rewarded as it deſerved; the Cimbri ran to arms, and not only repulſed the Romans, but, attacking them in their turn, utterly defeated them, and obliged the ſhattered remains of their forces to conceal themſelves in the neighbouring foreſts. After this victory the Cimbri entered Tranſalpine Gaul, which they quickly filled with ſlaughter and deſolation. Here they continued five or ſix years, when another Roman army under the conſul Silanus marched againſt them. This general met with no better ſucceſs than Carbo had done. His army was routed at the firſt onſet; in conſequence of which, all Narbonne Gaul was expoſed at once to the ravages of theſe barbarians.

About 105 years before Chriſt, the Cimbri began to threaten the Roman empire itſelf with deſtruction. The Gauls marched from all parts with a deſign to join them, and to invade Italy. The Roman army was commanded by the proconſul Cæpio, and the conſul Mallius; but as theſe two commanders could not agree, they were adviſed to ſeparate, and divide their forces. This advice proved the ruin of the whole army. The Cimbri immediately fell upon a ſtrong detachment of the conſular army commanded by M. Aurelius Scaurus, which they cut off to a man, and made Scaurus himſelf priſoner. Mallius being greatly intimidated by this defeat, deſired a reconciliation with Cæpio, but was haughtily refuſed. He moved nearer the conſul, however, with his army, that the enemy might not be defeated without his having a ſhare in the action. The Cimbri, by this movement, imagining the commanders had made up their quarrel, ſent ambaſſadors to Mallius with propoſals of peace. As they could not help going through Cæpio's camp, he ordered them to be brought before him; but finding they were empowered to treat only with Mallius, he could ſcarce be reſtrained from putting them to death. His troops, however, forced him to confer with Mallius about the propoſals ſent by the barbarians: but as Cæpio went to the conſul's tent againſt his will, ſo he oppoſed him in every thing; contradicted with great obſtinacy, and inſulted him in the groſſeſt manner. The deputies on their return acquainted their countrymen that the miſunderſtanding between the Roman commanders ſtill ſubſiſted; upon which the Cimbri attacked the camp of Cæpio, and the Gauls that of Mallius. Both were forced, and the Romans ſlaughtered without mercy. Eighty thouſand citizens and allies of Rome, with 40,000 ſervants and ſutlers, periſhed on that fatal day. In ſhort, of the two Roman armies only 10 men, with the two generals, eſcaped to carry the news of ſo dreadful a defeat. The conquerors deſtroyed all the ſpoil, purſuant to a vow they had made before the battle. The gold and ſilver they threw into the Rhone, drowned the horſes they had taken, and put to death all the priſoners.

The Romans were thrown into the utmoſt conſternation on the news of ſo terrible an overthrow. They ſaw themſelves threatened with a deluge of Cimbri and Gauls, numerous enough to overrun the whole country. The did not, however, deſpair. A new army was raiſed with incredible expedition; no citizen whatever who was fit to bear arms being exempted. On this occaſion alſo, fencing-maſters were firſt introduced into the Roman camp; by which means the ſoldiers were ſoon rendered in a manner invincible. Marius, who was at that time in high reputation on account of his victories in Africa, was choſen commander, and waited for the Cimbri in Tranſalpine Gaul: but they had reſolved to enter Italy by two different ways; the Cimbri over the eaſtern, and the Teutones and other allies over the weſtern Alps. The Roman general therefore marched to oppoſe the latter, and defeated the Ambrones and Teutones with great ſlaughter *. The Cimbri, in the mean time, entered Italy, and ſtruck the whole country with terror. Catullus and Sylla attempted to oppoſe them; but their ſoldiers were ſo intimidated by the fierce countenances and terrible appearance of theſe barbarians, that nothing could prevent their flying before them. The city of Rome was now totally defenceleſs; and, had the Cimbri only marched briſkly forwards they had undoubtedly become maſters of it; but they waited in expectation of being joined by their allies the Ambrones and Teutones, not having heard of their defeat by Marius, till the ſenate had time to recal him to the defence of his country. By their order he joined his army to that of Catullus and Sylla; and upon that union was declared commander in chief. The Roman army conſiſted of 52,300 men. The cavalry of the Cimbri were no more than 15,000, but their foot ſeemed innumerable; for, being drawn up in a ſquare, they are ſaid to have covered 30 furlongs. The Cimbri attacked the Romans with the utmoſt fury; but, being unaccuſtomed to bear the heats of Italy, they ſoon began to loſe their ſtrength, and were eaſily overcome. But they had put it out of their power to fly; for, that they might keep their ranks the better, they had, like true barbarians, tied themſelves together with cords faſtened to their belts, ſo that the Romans made a moſt terrible havoc of them. The battle was therefore ſoon over, and the whole day employed only in the moſt terrible butchery. An hundred and twenty thouſand were killed on the field of battle, and 60,000 taken priſoners. The victorious Romans then marched to the enemy's camp, where they had a new battle to fight with the women, whom they found more fierce than even their huſbands had been. From their carts and waggons, which formed a kind of fortification, they diſcharged ſhowers of darts and arrows on friends and foes without diſtinction. They firſt ſuffocated their children in their arms, and then put an end to their own lives. The greateſt part of them hanged themſeves on trees. One was found hanging at a cart with two of her children at her heals. Many of the men, for want of trees and ſtakes, tied ſtrings in running knots about their necks, and faſtened them to the tails of their horſes, and the horns and feet of their oxen, in order to ſtrangle themſelves that way; and thus the whole multitude was deſtroyed.

The country of the Cimbri, which, after this terrible cataſtrophe, was left a mere deſert, was again peopled by the Scythians; who being driven by Pompey out of that vaſt ſpace between the Euxine and the Caſpian ſea, marched towards the north and weſt of Europe,

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* See *Ambrones* and *Teutones*.

Europe, ſubduing all the nations they met with in their way. They conquered Ruſſia, Saxony, Weſtphalia, and other countries as far as Finland, Norway, and Sweden. It is pretended that Wodin their leader traverſed ſo many countries, and endeavoured to ſubdue them, only with a view to excite the people againſt the Romans; and that the ſpirit of animoſity which he had excited operated ſo powerfully after his death, that the northern nations combined to attack it, and never ceaſed their incurſions till it was totally ſubverted.

CIMEX, or Bug, in *Zoology*, a genus of inſects belonging to the order of hemiptera. See Entomology *Index*.

The methods of expelling houſe-bugs are various, as oil of turpentine, the ſmoke of corn-mint, of narrow-leaved wild creſs, of herb-robert, of the reddiſh agaric, of muſtard, Guinea pepper, peats or turf, &c. See alſo Bug and Cimicifuga.

CIMICIFUGA. See Botany *Index*.

The cimicifuga fœtida has obtained the name of *cimicifuga*, or *bugbane*, both in Siberia and Tartary, from its property of driving away thoſe inſects; and the botaniſts of thoſe parts of Europe which are infeſted by them, have long deſired to naturaliſe it in their ſeveral countries. Gmelin mentions, that in Siberia the natives alſo uſe it as an evacuant in dropſy; and that its effects are violently emetic and draſtic.

CIMMERII, anciently a people near the Palus Mæotis. They invaded Aſia Minor 1284 years before Chriſt, and ſeized upon the kingdom of Cyaxares. After they had been maſters of the country for 28 years, they were driven back by Alyates king of Lydia. The name alſo of another nation on the weſtern coaſt of Italy. The country which they inhabited was ſuppoſed to be ſo gloomy, that to expreſs a great obſcurity the expreſſion of *Cimmerian darkneſs* has proverbially been uſed; and Homer, according to Plutarch, drew his images of hell and Pluto from the gloomy and diſmal conntry where they dwelt.

CIMMERIUM, in *Ancient Geography*, a town at the mouth of the Palus Mæotis; from which the Boſphorus Cimmerius is named; that ſtrait which joins the Euxine and the Palus Mæotis. *Cimmerii* was the name of the people, (Homer): and here ſtood the Promontorium Cimmerium, (Ptolemy); and hence probably the modern apellation *Crim*.

Cimmerium, in *Ancient Geography*, a place near Baiae, in Campania, where formerly ſtood the cave of the ſibyl. The people were called *Cimmerii*, who living in ſubterraneous habitations, from which they iſſued in the night to commit robberies and other acts of violence, never ſaw the light of the ſun (Homer). To give a natural account of this fable, Feſtus ſays, there was a valley ſurrounded with a pretty high ridge, which precluded the morning and evening ſun.

CIMOLIA terra, in *Natural Hiſtory*, a name by which the ancients expreſſed a very valuable medicinal earth; but which later ages have ſuppoſed to be no other than our tobacco-pipe clay and fuller's earth.

The cimolia terra of the ancients was found in ſeveral of the iſlands of the Archipelago, particularly in the iſland of Cimolus, from whence it has its name. It was uſed with great ſucceſs in the eryſipelas, inflammations, and the like, being applied by way of cataplaſm to the part. They alſo uſed, as we do, what we call *cimolia*, or fuller's earth, for the cleanſing of clothes. This earth of the ancients, though ſo long diſregarded, and by many ſuppoſed to be loſt, is yet very plentiful in Argentiere (the ancient Cimolus), Sphanto, and many of thoſe iſlands. It is a marl of a lax and crumbly texture, and a pure bright white colour, very ſoft to the touch. It adheres firmly to the tongue, and, if thrown into water, raiſes a little hiſſing and ebullition, and moulders to a fine powder. It makes a conſiderable efferveſcence with acids, and ſuffers no change of colour in the fire. Theſe are the characters of what the ancients called ſimply *terra cimolia*; but beſides this, they had from the ſame place another earth which they called by the ſame general name, but diſtinguiſhed by the epithet purple, *purpureſcens*. This they deſcribed to be fattiſh, cold to the touch, of a mixed purple colour, and nearly as hard as a ſtone. And this was evidently the ſubſtance we call *ſteatites*, or the *ſoap-rock*, common in Cornwall, and alſo in the iſland of Argentiere, or Cimolus.

Cimolia Alba, the officinal name of the earth of which we now make tobacco-pipes. Its diſtinguiſhing characters are, that it is a denſe, compact, heavy earth, of a dull white colour, and very cloſe texture; it will not eaſily break between the fingers, and ſlightly ſtains the ſkin in handling. It adheres firmly to the tongue; melts very ſlowly in the mouth, and is not readily diffuſible in water. It is found in many places. That of the iſle of Wight is much eſteemed for its colour. Great plenty of it is found near Pole in Dorſetſhire, and near Wedenſbury in Staffordſhire.

Cimolia Nigra, is of a dark lead colour, hard, dry, and heavy; of a ſmooth compact texture, and not viſcid: it does not colour the hands; crumbles when dry; adheres to the tongue; diffuſes ſlowly in water; and is not acted upon by acids. It burns perfectly white, and acquires a conſiderable hardneſs. The chief pits for this clay are near Northampton, where it is uſed in the manufacture of tobacco-pipes. It is alſo mixed with the critche clay of Derbyſhire, in the proportion of one part to three, in the manufacture of the hard reddiſh brown ware.

CIMOLUS, in *Ancient Geography*, one of the Cyclades, now called *Argentiere*.

CIMON, an Athenian, ſon of Miltiades and Hegiſipyle. He was famous for his debaucheries in his youth, and the reformation of his morals when arrived to years of diſcretion. He behaved with great courage at the battle of Salamis, and rendered himſelf popular by his munificence and valour. He defeated the Perſian fleet, took 200 ſhips, and totally routed their land army, the very ſame day, A. U. C. 284. The money that he had obtained by his victories was not applied for his own private uſe, but with it he fortified and embelliſhed the city. He ſome time after loſt all his popularity, and was baniſhed by the Athenians, who declared war againſt the Lacedæmonians. He was recalled from his exile, and at his return he made a reconciliation between Lacedæmon and his countrymen. He was afterwards appointed to carry on the war againſt Perſia in Egypt and Cyprus, with a fleet of 200 ſhips, and on the coaſt of Aſia he gave battle to the enemy, and totally ruined their fleet, A. U. C. 304.

He died as he was beſieging the town of Citium in Cyprus. He may be called the laſt of the Greeks whoſe ſpirit and boldneſs defeated the armies of the barbarians. He was ſuch an inveterate enemy to the Perſian power, that he formed a plan of totally deſtroying it; and in his wars he had ſo reduced the Perſians, that they promiſed in a treaty not to paſs the Chelidonian iſlands with their fleet, or to approach within a day's journey of the Grecian ſeas. See Attica.

CINALOA, a province of Mexico in South America, abounding in corn, cattle, and cotton; and rendered extremely pictureſque by a number of beautiful caſcades of clear water that fall down from the mountains. It lies on the eaſtern coaſt of the ſea of California, and has a town of the ſame name, ſituated in N. Lat. 26°.

CINARA, in *Botany*, the Artichoke. See Cynara, Botany *Index*.

CINCHONA. See Botany *Index*.

According to ſome, the Peruvians learned the uſe of the bark of this tree by obſerving certain animals affected with intermittents inſtinctively led to it; while others ſay, that a Peruvian having an ague, was cured by happening to drink of a pool which, from ſome trees having fallen into it, taſted of cinchona; and its uſe in gangrene is ſaid to have originated from its curing one in an aguiſh patient. About the year 1640, the lady of the Spaniſh viceroy, the Comitiſſa del Cinchon, was cured by the bark, which has therefore been called *Cortex* or *Pulvis Comitiſſæ Cinchona*, *Chinachina*, or *Chinchina*, *Kinakina* or *Kinkina*, *Quinaquina* or *Quinquina*; and from the intereſt which the cardinal de Lugo and the Jeſuit fathers took in its diſtribution, it has been called *Cortex* or *Pulvis Cardinalis de Lugo*, *Jeſuiticus*, *Patrum*, *&c.*

On its firſt introduction into Europe, it was reprobated by many eminent phyſicians; and at different periods long after, it was conſidered a dangerous remedy; but its character, in proceſs of time, became very univerſally eſtabliſhed. For a number of years, the bark which is rolled up into ſhort thick quills, with a rough coat, and a bright cinnamon colour, in the inſide, which broke brittle, and was ſound, had an aromatic flavour, a bitteriſh aſtringent taſte, with a degree of aromatic warmth, was eſteemed the beſt; though ſome eſteemed the large pieces as of equal goodneſs. During the time of the late war, in the year 1779, the Huſſar frigate took a Spaniſh ſhip loaded principally with Peruvian bark, which was much larger, thicker, and of a deeper reddiſh colour than the bark in common uſe. Soon after it was brought to London, it was tried in St Bartholomew's hoſpital, and in other hoſpitals about town, and was ſaid to be more efficacious than the quill bark. This put practitioners on examining into the hiſtory of the bark, on trying experiments with it, and of making comparative trials of its effects with thoſe of the bark in common uſe on patients labouring under intermittent complaints. In July 1782, Dr William Saunders publiſhed an account of this red bark, in which he ſays, that the ſmall quill bark uſed in England is either the bark of young trees, or of the twigs or branches of the old ones; and that the large bark, called the *red bark* from the deep colour, is the bark of the trunk of the old trees; and he mentions a Mr Arnot, who himſelf gathered the bark from the trees in Peru; and Monſ. Condamine, who gives an account of the tree in the Memoirs of the Academy of Sciences at Paris in the year 1738; who both ſay, that taking the bark from an old tree effectually kills it; but that moſt of the young trees which are barked, recover, and continue healthy; and that for theſe reaſons the Spaniards now barked the younger trees for foreign markets, though they ſtill imported into Spain ſome of the bark of the old trees, which they eſteemed to be much more efficacious that what was got from the young. From theſe accounts Dr Saunders concludes, that the large red bark brought to London in the year 1779 was of the ſame kind as that uſed by Sydenham and Morton, as it anſwers to the deſcription of the bark uſed in their time, which is given by Dale and other writers on the materia medica, who were their contemporaries. Dr Saunders ſays, that it is not only ſtronger and more reſinous, but likewiſe more efficacious and certain in its effect, than the common bark, and had cured many agues after the other had failed.

A ſpecies of cinchona has alſo been diſcovered in the Weſt India iſlands, particularly in Jamaica. It is accurately deſcribed by Dr Wright, under the title of *Cinchona Jamaicenſis*, in a paper publiſhed in the Philoſophical Tranſactions. In Jamaica it is called the *ſea-ſide beech*, and grows from 20 to 40 feet high. The white, furrowed, thick outer bark is not uſed; the dark-brown inner bark has the common flavour, with a mixed kind of a taſte, at firſt of horſe-radiſh and ginger, becoming at laſt bitter and aſtringent. It ſeems to give out more extractive matter than the cinchona officinalis. Some of it was imported from St Lucia, in conſequence of its having been uſed with advantage in the army and navy during the laſt war; and it has lately been treated of at conſiderable length by Dr Kentiſh, under the title of *St Lucia bark*. The freſh bark is found to be conſiderably emetic and cathartic, which properties it is ſaid to loſe on drying.

The pale and the red are chiefly in uſe in Britain. The pale is brought to us in pieces of different ſizes, either flat or quilled, and the powder is rather of a lighter colour than that of cinnamon. The red is generally in much larger, thicker, flattiſh pieces, but ſometimes alſo in the form of quills, and its powder is reddiſh like that of Armenian bole. As already obſerved, it is much more reſinous, and poſſeſſes the ſenſible qualities of the cinchona in a much higher degree than the other ſorts; and the more nearly the other kinds reſemble the red bark, the better they are now conſidered. The red bark is heavy, firm, ſound, and dry; friable between the teeth; does not ſeparate into fibres; and breaks, not ſhivery, but ſhort, cloſe, and ſmooth. It has three layers; the outer is thin, rugged, of a reddiſh brown colour, but frequently covered with moſſy matter; the middle is thicker, more compact, darker coloured, very reſinous, brittle, and yields firſt to the peſtle; the inmoſt is more woody, fibrous, and of a brighter red.

The Peruvian bark yields its virtues both to cold and boiling water; but the decoction is thicker, gives out its taſte more readily, and forms an ink with a chalybeate more ſuddenly than the freſh cold infuſion. This infuſion, however, contains at leaſt as much extractive matter, but more in a ſtate of ſolution; and its colour, on ſtanding ſome time with the chalybeate, becomes darker, while that of the decoction becomes more faint. When they are of a certain age, the addition of a chalybeate renders them green; and when this is the caſe, they are found to be in a ſtate of fermentation, and effete. Mild or cauſtic alkalies, or lime, precipitate the extractive matter, which in the caſe of the cauſtic alkali is rediſſolved by a farther addition of the alkali. Lime-water precipitates leſs from a freſh infuſion than from a freſh decoction; and in the precipitate of this laſt ſome mild earth is perceptible. The infuſion is by age reduced to the ſame ſtate with the freſh decoction, and then they depoſite nearly an equal quantity of mild earth and extractive matter; ſo that lime-water, as well as a chalybeate, may be uſed as a teſt of the relative ſtrength, and periſhable nature of the different preparations, and of different barks. Accordingly cold infuſions are found by experiments to be leſs periſhable than decoctions; infuſions and decoctions of the red bark than thoſe of the pale; thoſe of the red bark, however, are found by length of time to ſeparate more mild earth with the lime-water, and more extractive matter. Lime-water, as precipitating the extractive matter, appears an equally improper and diſagreeable menſtruum.

Water is found to ſuſpend the reſin by means of much leſs gum than has been ſuppoſed. Alcohol extracts a bitterneſs, but no aſtringency, from a reſiduum of 20 affuſions of cold water; and water extracts aſtringency, but no bitterneſs from the reſiduum of as many affuſions of alcohol. The reſiduum in both is inſipid.

From many ingenious experiments made on the Peruvian bark by Dr Irvine, which are now publiſhed in a diſſertation which gained the prize-medal given by the Harveian Society of Edinburgh for 1783, the power of different menſtrua, as acting upon Peruvian bark, is aſcertained with greater accuracy than had before been done; and it appears, that with reſpect to comparative power, the fluids after mentioned act in the order in which they are placed.

Dulcified ſpirit of vitriol.
Cauſtic ley.
French brandy.
Rheniſh wine.
Soft water.
Vinegar and water.
Dulcified ſpirit of nitre.
Mild volatile alkali.
Alcohol.
Mild vegetable alkali.
Lime-water.

The antiſeptic powers of vinegar and bark united are double the ſum of thoſe taken ſeparately. The aſtringent power of the bark is increaſed by ſulphuric acid; and the bitter taſte is deſtroyed by it.

The officinal preparations of the bark are, 1. The powder: of this, the firſt parcel that paſſes the ſieve being the moſt reſinous and brittle layer, is the ſtrongeſt. 2. The extract: the watery and ſpirituous extract conjoined form the moſt proper preparations of this kind. 3. The reſin: this cannot perhaps be obtained ſeparate from the gummy part, nor would it be deſirable. 4. Spirituous tincture: this is beſt made with proof-ſpirit. 5. The decoction: this preparation, though frequently employed, is yet in many reſpects inferior even to a ſimple watery infuſion.

The beſt form is that of powder, in which the conſtituent parts are in the moſt effectual proportion. The cold infuſion, which can be made in a few minutes by agitation, the ſpirituous tincture, and the extract, are likewiſe proper in this reſpect. For covering the taſte, different patients require different vehicles; liquorice, aromatics, acids, port-wine, ſmall beer, porter, milk, butter-milk, &c. are frequently employed; and thoſe who diſlike the taſte of the bark itſelf, vary in their accounts to which the preference is due; or it may be given in form of electuary with currant jelly, or with brandy or rum.

Practitioners have differed much with regard to the mode of operation of the Peruvian bark. Some have aſcribed its virtues entirely to a ſtimulant power. But while the ſtrongeſt and moſt permanent ſtimuli have by no means the ſame effect with bark in the cure of diſeaſes, the bark itſelf ſhows hardly any ſtimulant power, either from its action on the ſtomach, or on other ſenſible parts to which it is applied. From its action on dead animal fibres, there can be no doubt of its being a powerful aſtringent; and from its good effects in certain caſes of diſeaſe, there is reaſon to preſume that it is a ſtill more powerful tonic. To this tonic power ſome think that its action as an antiſeptic is to be entirely attributed; but that, independently of this, it has a very powerful effect in reſiſting the ſeptic proceſs to which animal ſubſtances are naturally ſubjected, appears beyond all diſpute, from its effects in reſiſting putrefaction, not only in dead animal ſolids, but even in animal fluids, when entirely detached from the living body.

But although it be admitted that the Peruvian bark acts powerfully as an aſtringent, as a tonic, and as an antiſeptic; yet theſe principles will by no means explain all the effects derived from it in the cure of diſeaſes. And accordingly, from no artificial combination in which theſe powers are combined, or in which they exiſt even to a higher degree, can the good conſequences reſulting from Peruvian bark be obtained. Many practitioners, therefore, are diſpoſed to view it as a ſpecific. If by a ſpecific we mean an infallible remedy, it cannot indeed be conſidered as intitled to that appellation; but in as far as it is a very powerful remedy, of the operation of which no ſatisfactory explanation has yet been given, it may with great propriety be denominated a ſpecific. But whatever its mode of operation may be, there can be no doubt that it is daily employed with ſucceſs in a great variety of different diſeaſes.

It was firſt introduced, as has already been ſaid, for the cure of intermittent fevers; and in theſe, when properly exhibited, it rarely fails of ſucceſs. Practitioners, however, have differed with regard to the beſt mode of exhibition; ſome prefer giving it juſt before the fit, ſome during the fit, others immediately after it. Some, again, order it in the quantity of an ounce, between the fits; the doſe being the more frequent and larger according to the frequency of the fits; and this mode of exhibition, although it may perhaps ſometimes lead to the employment of more bark than is neceſſary, we conſider as upon the whole preferable, from being beſt ſuited to moſt ſtomachs. The requiſite quantity is very different in different caſes; and in many vernal intermittents it ſeems even hardly neceſſary.

It often pukes or purges, and ſometimes oppreſſes the ſtomach. Theſe, or any other effects that may take place, are to be counteracted by remedies particularly appropiated to them. Thus, vomiting is often reſtrained by exhibiting it in wine; looſeneſs, by combining it with opium; and oppreſſion at ſtomach, by the addition of an aromatic. But unleſs for obviating particular occurrences, it is more ſucceſsful when exhibited in its ſimple ſtate than with any addition; and there ſeems to be little ground for believing that its powers are increaſed by crude ſal ammoniac, or any other additions which have frequently been made.

It is now given, from the very commencement of the diſeaſe, without previous evacuations, which, with the delay of the bark, or under doſes of it, by retarding the cure, often ſeem to induce abdominal inflammation, ſcirrhus, jaundice, hectic, dropſy, &c. ſymptoms formerly imputed to the premature or intemperate uſe of the bark, but which are beſt obviated by its early and large uſe. It is to be continued not only till the paroxyſms ceaſe, but till the natural appetite, ſtrength, and complexion, return. Its uſe is then to be gradually left off, and repeated at proper intervals to ſecure againſt a relapſe; to which, however unaccountable, independently of the recovery of vigour, there often ſeems to be a peculiar diſpoſition; and eſpecially when the wind blows from the eaſt. Although, however, moſt evacuants conjoined with the Peruvian bark in intermittents are rather prejudicial than otherwiſe, yet it is of advantage, previous to its uſe, to empty the alimentary canal, particularly the ſtomach; and on this account good effects are often obtained from premiſing an emetic.

It is a medicine which ſeems not only ſuited to both formed and latent intermittents, but to that ſtate of fibre on which all rigidly periodical diſeaſes ſeem to depend; as periodical pain, inflammation, hemorrhagy, ſpaſm, cough, loſs of external ſenſe, &c.

Bark is now uſed by ſome in all continued fevers: at the ſame time attention is paid to keep the bowels clean, and to promote when neceſſary the evacuation of redundant bile; always, however, ſo as to weaken as little as poſſible.

In confluent ſmall-pox, it promotes languid eruption and ſuppuration, diminiſhes the fever through the whole courſe of it, and prevents or corrects putreſcence and gangrene.

In gangrenous ſore throats it is much uſed, as it is externally and internally in every ſpecies of gangrene.

In contagious dyſentery, after due evacuation, it has been uſed by the mouth, and by injection with and without opium.

In all thoſe hemorrhagies called *paſſive*, and which it is allowed all hemorrhagies are very apt to become, and likewiſe in other increaſed diſcharges, it is much uſed; and in certain undefined caſes of hæmoptyſis, ſome allege that it is remarkably effectual when joined with an abſorbent.

It is uſed for obviating the diſpoſition to nervous and convulſive diſeaſes; and ſome have great confidence in it joined with ſulphuric acid, in caſes of phthiſis, ſcrophula, ill-conditioned ulcers, rickets, ſcurvy, and in ſtates of convaleſcence.

In theſe caſes in general, notwithſtanding the uſe of the acid, it is proper to conjoin it with a milk diet.

In dropſy, not depending on any particular local affection, it is often alternated or conjoined with diuretics, or other evacuants; and by its early exhibition after the water is once drawn off, or even begins to be freely diſcharged, a freſh accumulation is prevented, and a radical cure obtained. In obſtinate venereal caſes, particularly thoſe which appear under the form of pains in the bones, the Peruvian bark is often ſucceſsfully ſubjoined to mercury, or even given in conjunction with it.

CINCINNATUS, the Roman dictator, was taken from the plough, to be advanced to the dignity of conſul, in which office he reſtored public tranquillity, and then returned to his rural employments. Being called forth a ſecond time to be dictator, he conquered the enemies of Rome, and refuſing all rewards, retired again to his farm, after he had been dictator only 16 days. The ſame circumſtance appeared once more in the 80th year of his age. He died 376 years before Chriſt.

Order of CINCINNATUS, or *the Cincinnati*, a ſociety which was eſtabliſhed in America ſoon after the peace, and conſiſts of the generals and officers of the army and navy of the United States. This inſtitution, called after the name of the Roman dictator mentioned in the preceding article, was intended to perpetuate the memory of the revolution, the friendſhip of the officers, and the union of the ſtates; and alſo to raiſe a fund for the relief of poor widows and orphans, whoſe huſbands and fathers had fallen during the war, and for their deſcendants. The ſociety was ſubdivided into ſtate ſocieties, which were to meet on the 4th of July, and with other buſineſs depute a number of their members to convene annually in general meetings. The members of the inſtitution were to be diſtinguiſhed by wearing a medal, emblematical of the deſign of the ſociety; and the honours and advantages were to be hereditary in the eldeſt male heirs, and in default of male iſſue, in the collateral male heirs. Honorary members were to be admitted, but without the hereditary advantages of the ſociety, and provided their number ſhould never exceed the ratio of one to four of the officers or their deſcendants. Though the apparent deſigns of this ſociety were harmleſs and honourable, it did not eſcape popular jealouſy. Views of a deeper nature were imputed to the framers, and the inſtitution was cenſured and oppoſed as giving birth to a military nobility, of a dangerous ariſtocratic power, which might ultimately prove ruinous to the liberties of the new empire. But the principal ground of apprehenſion was the ſuppoſed right of inheritance connected with this honour to render it hereditary; which, however, hath been given up and totally diſclaimed by the ſociety.

CINCTURE, in *Architecture*, a ring, liſt, or orlo, at the top and bottom of the ſhaft of a column, ſeparating the ſhaft at one end from the baſe, and at the other from the capital.

CINEAS, a Theſſalian, miniſter and friend to Pyrrhus king of Epirus. He was ſent to Rome by his maſter to ſue for a peace, which he, however, could not obtain. He told Pyrrhus that the Roman ſenate was a venerable aſſembly of kings; and obſerved, that to fight with them was to fight againſt another Hydra. He was of ſuch a retentive memory, that the day after his arrival at Rome he could call every ſenator and knight by his name.

CINERITIOUS, an appellation given to different ſubſtances, on account of their reſembling aſhes either in colour or conſiſtence; hence it is that the cortical part of the brain has ſometimes got this epithet.

CINNA, L. Corn. a Roman who oppreſſed the republic with his cruelties. He was baniſhed by Octavius for attempting to make the fugitive ſlaves free. He joined himſelf with Marius, and with him at the head of the ſlaves he defeated his enemies and made himſelf conſul even to a fourth time. He maſſacred ſo many citizens at Rome, that his name became odious, and one of his officers aſſaſſinated him at Ancona, as he was preparing war againſt Sylla.

Cinna, *C. Helvius*, a poet intimate with Cæſar. He went to attend the obſequies of Cæſar, and being miſtaken by the populace for the other Cinna, he was torn to pieces.—Alſo a grandſon of Pompey's. He conſpired againſt Auguſtus, who pardoned him, and made him one of his moſt intimate friends. He was conſul A. U. C. 758, and made Auguſtus his heir.

CINNABAR, in *Natural Hiſtory*, is either native or factitious.

The *native* cinnabar is an ore of quickſilver, moderately compact, very heavy, and of an elegant ſtriated red colour.

Factitious cinnabar is a mixture of mercury and ſulphur ſublimed, and thus reduced into a fine red glebe. The beſt is of a high colour, and full of fibres like needles. See Chemistry *Index*.

The chief uſe of cinnabar is for painting. Although the body is compoſed of ſulphur, which is of a light colour, and mercury, which is white as ſilver, it is nevertheleſs of an exceeding ſtrong red colour. Lumps of it are of a deep brown red without brilliancy; but when the too great intenſity of its colour is diminiſhed by bruiſing and dividing it into ſmall parts, (which is a method generally uſed to leſſen the intenſity of all colours), the red of the cinnabar becomes more and more exalted, flame-coloured, and exceedingly vivid and brilliant: in this ſtate it is called *vermilion*.

Cinnabar is often employed as an internal medicine. Hoffman greatly recommends it as a ſedative and antiſpaſmodic, and Stahl makes it an ingredient in his *temperant powder*. Other intelligent phyſicians deny that cinnabar taken internally has any medicinal quality. Their opinion is grounded on the inſolubility of this ſubſtance in any menſtruum. This queſtion concerning its internal utility cannot be decided without further reſearches and experiments; but cinnabar is certainly uſed with ſucceſs to procure a mercurial fumigation, when that method of cure is proper in venereal diſeaſes. For this purpoſe it is burnt in an open fire on red-hot coals, by which the mercury is diſengaged and forms vapours, which, being applied to the body of the diſeaſed perſon, penetrate through the pores of the ſkin, and produce effects ſimilar to thoſe of mercury adminiſtered by friction.

CINNAMON, the bark of two ſpecies of laurus. The true cinnamon is from the laurus cinnamomum; and the baſe cinnamon, which is often ſold for the true, is from the laurus caſſia. See Laurus, Botany *Index*.

Cinnamon-Water, is made by diſtilling the bark firſt infuſed in alcohol, brandy, or white-wine.

Clove Cinnamon, is the bark of a tree growing in Brazil, which is often ſubſtituted for real cloves.

White Cinnamon, called alſo *Winter's bark*, is the bark of a tree frequent in the iſles of St Domingo, Guadaloupe, &c. of a ſharp biting taſte like pepper. Some uſe it inſtead of nutmeg; and in medicine it is eſteemed a ſtomachic and antiſcorbutic. See Canella.

CINNAMUS, a Greek hiſtorian, wrote a hiſtory of the eaſtern empire during the reigns of John and Manuel Commenes, from 1118 to 1143. His ſtyle is reckoned the beſt of the modern Greek authors. He died after 1183.

CINNERETH, Cinereth, *Chinnereth*, (Moſes); or *Genneſareth*, in *Ancient Geography*, a lake of the Lower Galilee, called the *Sea of Galilee*, (Matthew); *of Tiberius*, (John). Its name *Genneſareth* is from a ſmall cognominal diſtrict upon it. In breadth 40 ſtadia, in length 140. The water freſh and fit to drink, and abounding in fiſh.

CINQUEFOIL, in *Botany*. See Potentilla.

CINQUE Ports, five havens that lie on the eaſt part of England, towards France; thus called by way of eminence on account of their ſuperior importance, as having been thought by our kings to merit a particular regard for their preſervation againſt invaſion. Hence they have a particular policy, and are governed by a keeper with the title of *Lord-warden of the Cinque-ports*.

Camden tells us, that William the Conqueror firſt appointed a warden of the Cinque-ports; but King John firſt granted them their privileges, and that upon condition they ſhould provide 80 ſhips at their own charge for 40 days, as often as the king ſhould have occaſion in the wars, he being then ſtraitened for a navy to recover Normandy.

The five ports are Haſtings, Romney, Hythe, Dover, and Sandwich.—Thorn tells us, that Haſtings provided 21 veſſels, and in each veſſel 21 men. To this port belong Seaford, Pevenſey, Hedney, Winchelſea, Rye, Hamine, Wakeſbourn, Creneth, and Forthclipe.—Romney provided five ſhips, and in each 24 men. To this belonged Bromhal, Lyde, Oſwarſtone, Dangemares, and Romenhal.—Hythe furniſhed ſeven ſhips, and in each 21 ſeamen. To this belongs Weſtmeath.—Dover the ſame number as Haſtings. To this belongs Folkſton, Feverſham, and Marge.—Laſtly, Sandwich furniſhed the ſame with Hythe. To this belong Fordiwic, Reculver, Serre, and Deal.

The privileges granted to them in conſequence of theſe ſervices were very great. Amongſt others, they were each of them to ſend two barons to repreſent them in parliament; their deputies were to bear the canopy over the king's head at the time of his coronation, and to dine at the uppermoſt table in the great

great hall on his right hand; to be exempted from ſubſidies and other aids; their heirs to be free from perſonal wardſhip, notwithſtanding any tenure; to be impleaded in their own towns, and not elſewhere; not to liable to tolls, &c.

The Cinque-ports give the following titles: Haſtings, a barony to the ancient family of Huntington: Romney, to the Marſhams: Dover, new barony, to a branch of the York family: formerly a dukedom (now extinct) to the Queenſberry family: Sandwich, an earldom to a branch of the Montagues.

CINTRA, a cap and mountain of Portugal, in the province of Eſtremadura, uſually called the *Rock of Liſbon.* It lies on the north ſide of the entrance of the river Tajo; and there is a town of the ſame name ſituated thereon. W. Long. 10. 15. N. Lat. 59. 0.

CINUS, or CYNUS, a famous civilian of Piſtoia in the 14th century. His commentary on the Code was finiſhed in 1313; he alſo wrote on ſome parts of the digeſt. He was no leſs famous for his Italian poems, and is ranked among thoſe who firſt gave graces to the Tuſcan lyric poetry.

CINYRA, in the Jewiſh antiquities, a muſical inſtrument. This, and the Hebrew *cinnor*, which is generally tranſlated *cithera*, *lyra*, or *pſalterium*, are the ſame. It was made of wood, and was played on in the temple of Jeruſalem. Joſephus ſays that the *cinyra* of the temple had ten ſtrings, and that it was touched with a bow. In another place he ſays that Solomon made a great number of them with a precious kind of metal called *electrum*, wherein he contradicts the Scriptures, which inform us that Solomon's *cinnors* were made of wood.

CINYRAS, in fabulous hiſtory, a king of Cyprus, ſon of Paphus. He married Cenchreis, by whom he had a daughter called *Myrrha.* Myrrha fell in love with her father, and in the abſence of her mother ſhe introduced herſelf into his bed by means of her nurſe. Cinyras had by her a ſon called *Adonis*; and when he knew the inceſt he had committed, he attempted to ſtab his daughter, who eſcaped his purſuit and fled to Arabia, where, after ſhe had brought forth, ſhe was changed into a tree which ſtill bears her name. Cinyras, according to ſome, ſtabbed himſelf.

CION, or CYON, in *Gardening*, a young ſhoot, ſprout, or ſprig, put forth by a tree. Grafting is performed by the application of the cion of one plant upon the ſtock of another. To produce a ſtock of cions for grafting, planting, &c. the gardeners ſometimes cut off the bodies of trees a little above the ground, and only leave a ſtump or root ſtanding: the redundant ſap will not fail next ſpring to put forth a great number of ſhoots. In dreſſing dwarf-trees, a great many cions are to be cut off.

CIOTAT, a ſea-port town of Provence in France; famous for Muſcadine wine. It is ſeated on the bay of Laquea, between Marſeilles and Toulon; and the harbour is defended by a ſtrong fort. E. Long. 5. 30. N. Lat. 43. 10.

CIPHER, or CYPHER, one of the Arabic characters or figures uſed in computation, formed thus, 0. See ARITHMETIC.

CIPHER is alſo a kind of enigmatic character, compoſed of ſeveral letters interwoven, which are generally the initial letters of the perſons names for whom the ciphers are intended. Theſe are frequently uſed on ſeals, coaches, and other moveables.—Anciently, merchants and tradeſmen were not allowed to bear arms: in lieu thereof, they bore their ciphers, or the initial letters of their names, artfully interwoven about a croſs, of which we have divers inſtances on tombs, &c. See DEVISE.

CIPHER, denotes likewiſe certain ſecret characters diſguiſed and varied, uſed in writing letters that contain ſome ſecret, not to be underſtood but by thoſe between whom the cipher is agreed on.

De la Guilletiere, in his *Lacedæmon ancient and modern*, endeavours to make the ancient Spartans the inventors of the art of writing in cipher. Their ſcytala, according to him, was the firſt ſketch of this myſterious art: theſe ſcytalæ were two rollers of wood, of equal length and thickneſs; one of them kept by the ephori, the other by the general of the army ſent on any expedition againſt the enemy. Whenſoever thoſe magiſtrates would ſend any ſecret orders to the general, they took a ſlip of parchment, and rolled it very juſtly about the ſcytala which they had reſerved, and in this ſtate wrote their intentions, which appeared perfect and conſiſtent while the parchment continued on the roll: when taken off, the writing was maimed, and without connexion, but was eaſily retrieved by the general, upon his applying it to his ſcytala.

Polybius ſays, that Æneas Tacitus, 2000 years ago, collected together 20 different manners of writing ſo as not to be underſtood by any but thoſe in the ſecret; part whereof were invented by himſelf, and part uſed before his time.—Trithemius, Cap. Porta, Vigenere, and P. Niceron, have written expreſsly on the ſubject of *ciphers.*

As the writing of *cipher* is become an art, ſo is the reading or unravelling thereof called *deciphering.*—The rules of deciphering are different in different languages. By obſerving the following, you will ſoon make out any common cipher written in Engliſh.

1. Obſerve the letters or characters that moſt frequently occur, and ſet them down for the ſix vowels, including *y*, and of theſe the moſt frequent will generally be *e*, and the leaſt frequent *u*.

2. The vowels that moſt frequently come together are *ea* and *ou*.

3. The conſonant moſt common at the ends of words is *s*, and the next frequent *r* and *t*.

4. When two ſimilar characters come together, they are moſt likely to be the conſonants *f*, *l*, or *s*, or the vowels *e* or *o*.

5. The letter that precedes or follows two ſimilar characters is either a vowel, or *l*, *m*, *n*, or *r*.

6. In deciphering, begin with the words that conſiſt of a ſingle letter, which will be either *a*, *I*, *o*, or *&*.

7. Then take the words of two letters, one of which will be a vowel. Of theſe words the moſt frequent are, *an*, *to*, *be*, *by*, *of*, *on*, *or*, *no*, *ſo*, *as*, *at*, *if*, *in*, *is*, *it*, *he*, *me*, *my*, *us*, *we*, *am*.

8. In words of three letters there are moſt commonly two conſonants. Of theſe words the moſt frequent are, *the*, *and*, *not*, *but*, *yet*, *for*, *tho'*, *how*, *why*, *all*, *you*, *ſhe*, *his*, *her*, *our*, *who*, *may*, *can*, *did*, *was*, *are*, *has*, *had*, *let*, *one*, *two*, *ſix*, *ten*, *&c*—Some of theſe, or thoſe of two letters, will be found in every ſentence.

9. The moſt common words of four letters are, *this*,

that, then, thus, with, when, from, here, ſome, moſt, none, they, them, whom mine, your, ſelf, muſt, will, have, been, were, four, five, nine, &c.

10. The moſt uſual words of five letters, are, *their, theſe, thoſe, which, where. while. ſince, there, ſhall, might, could, would, ought, three, ſeven, eight,* &c.

11. Words of two or more ſyllables frequently begin with double conſonants, or with a prepoſition ; that is, a vowel joined with one or more conſonants. The moſt common double conſonants are *bl, br, dr, fl, fr, gl, gr, ph, pl, pr, ſk, ſh, ſp, ſl, th, tr, wh, wr,* &c. and the moſt common prepoſitions are *com, con, de, dis, ex, im, in, int, mis, per, pre, pro, re, ſub, ſup, un,* &c.

12. The double conſonants moſt frequent at the end of long words, are, *ck, ld, lf, mn, nd, ng, rl, rm, rn, rp, rt, ſm, ſt, xt,* &c. and the moſt common terminations are *ed, en, er, es, et, ing, ly, ſon, ſion, tion, able, ence, ent, ment, full, leſs, neſs,* &c.

On Plate CXLIV. in vol. V. fig. 7. is given an example of a cipher wrote in arbitrary characters as is commonly practiſed. It will be eaſily deciphered by obſerving the rules : but when the characters are all placed cloſe together, as in the example fig 8. and as they always ſhould be, the deciphering is much more difficult.

To decipher a writing of this ſort, you muſt firſt look for thoſe characters that moſt frequently occur, and ſet them down for vowels as before. Then obſerve the ſimilar characters that come together ; but you muſt remember that two ſuch characters may here belong to two words. You are next to remember the combinations of two or three characters that are moſt frequent ; which will be ſome of the words in the ſeventh and eighth of the foregoing rules ; and by obſerving the other rules, you will infallibly diſcover, with time and attention, any cipher wrote on theſe principles.

When the words are wrote all cloſe together, if the key to the cipher were to be changed every word, according to a regular method agreed on between the parties, as might be done by either of the methods mentioned in N° II. below, with very little additional trouble, the writing would then be extremely difficult to decipher. The longer any letter written in cipher is, the more eaſy it is to decipher, as then the repetitions of the characters and combinations are the more frequent.

The following are the contents of the two foregoing ciphers, in which we have inverted the order of the words and letters, that they who are deſirous of trying their talent at deciphering, may not, inadvertently, read the explanation before the cipher.

enil eno ton dna shtnom elohw eerht, suoidifrep dna leurc o noituac & ecnedurp fo klat lliw uoy : on, rotiart, teelgen & ecnereffidni si ti. yltrohs rettel a em dues ot snaem emoſ dnif rehtie, trach eht morf semoc ti taht ees em tel &, erom ecaf ym ees ot erad reven ro.

evlewt fo ruoh eht ta thgin siht, ledatic eht fo etag eht erofeb elbmeſſa lliw sdneirf ruo lla. ruoh eht ot lautenup eb : deraperp llew emoc dna, ytrebil ruoy niager ot, ylevarb eid ro. thgin eht si siht, su sekam rehtie taht, etiuq su seodnu ro.

Contrivances for communicating intelligence by CIPHER.

I. *By means of a pack of cards.* The parties muſt previouſly agree in what manner the cards ſhall be firſt placed, and then how they ſhall be ſhuffled. Thus ſuppoſe the cards are to be firſt placed in the order as hereafter follows, and then ſhuffled by taking off 3 from the top, putting the next 2 over them, and the following 3 under them *, and ſo alternately. Therefore the party who ſends the cipher firſt writes the contents of it on a ſeparate paper, and then copies the firſt 32 letters on the cards, by writing one letter on every card ; he then ſhuffles them in the manner deſcribed, and writes the ſecond 32 letters : he ſhuffles them a ſecond time, and writes the third 32 letters, and ſo of the reſt. An example will make this plain. Suppoſe the letter to be as follows.

I am in full march to relieve you ; within| three days I ſhall be with you. If the ene|my in the mean time ſhould make an aſſau|lt, remember what you owe to your countr|y, to your family, and yourſelf. Live with ho|nour, or die wih glory.

Order of the cards before
the 1ſt ſhuffle.

Ace ſpade	*i a d u y i.*
Ten diamonds	*a l e u l*
Eight hearts	*m l m o i u*
King ſpades	*i s u m l*
Nine clubs	*n h l e o*
Seven diamonds	*f b m r i*
Nine diamonds	*u e a c t n*
Ace clubs	*l w k r y i*
Knave hearts	*l s e e a e*
Seven ſpades	*m i a r m w*
Ten clubs	*a i t b e r*
Ten hearts	*r r h o f*
Queen ſpades	*c h e e i*
Eight diamonds	*h a h y w*
Eight clubs	*t y o o o l*
Seven hearts	*o y a o h o*
Queen clubs	*r o n u y h*
Nine ſpades	*e u i y f y*
King hearts	*l e t e u o*
Queen diamonds	*i d s o e*
Eight ſpades	*c i n w s o*
Knave clubs	*v f a n t g*
Seven clubs	*e t s l y*
Ace hearts	*y r e b r*
Nine hearts	*o l n w o t*
Ace diamonds	*u h s t & d*
Knave ſpades	*w l m a l*
Ten ſpades	*i e y t r r*
King diamonds	*t t i b u r*
Queen hearts	*h h m m u*
King clubs	*i n a t h*
Knave diamonds	*n e u r o*

The perſon that receives theſe cards firſt places them in the order agreed on, and tranſcribes the firſt letter on every card. He then ſhuffles them, according to order, and tranſcribes the ſecond letter on each card. He ſhuffles them a ſecond time, and tranſcribes the third letters and ſo of the reſt.

If the cards were to be ſhuffled the ſecond time by threes and fours, the third time by twos and fours, &c. it would make the cipher ſtill more difficult to diſcover: though as all ciphers depend on the combination of letters, there are ſcarce any that may not be deciphered with time and pains; as we ſhall ſhow further on. Thoſe ciphers are the beſt that are by their nature moſt free from ſuſpicion of being ciphers; as for example, if the letters were there written with ſympathetic ink, the cards might then paſs for a common pack.

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* By ſhuffling the cards in this manner, there will remain only 2 to put under at laſt.

II. *By a dial.* On a piece of ſquare paſteboard ABCD, fig. 3. 4. draw the circle EFGH, and divide it into 26 equal parts, in each of which muſt be written one of the letters of the alphabet.

On the inſide of this there muſt be another circle of paſteboard, ILMN, moveable round the centre O, and the extremity of this muſt be divided into the ſame number of equal parts as the other. On this alſo muſt be written the letters of the alphabet, which, however, need not be diſpoſed in the ſame order. The perſon with whom you correſpond muſt have a ſimilar dial, and at the beginning of your letter you muſt put any two letters that anſwer to each other when you have fixed the dial.

Exam. Suppoſe you would write as follows: "If you will come over to us, you ſhall have a penſion, and you may ſtill make a ſham oppoſition." You begin with the letters *Ma,* which ſhow how the dial is fixed: then for *If you,* you write *un juc,* and ſo for the reſt, as you ſee at fig. 6.

The ſame intention may be anſwered by a ruler, the upper part of which is fixed, and the lower part made to ſlide; but in this caſe the upper part muſt contain two alphabets in ſucceſſion, that ſome letter of that part may conſtantly correſpond to one in the lower part. The diviſions ſtanding directly over each other in a ſtraight line will be much more obvious than in the circumference of a circle. Or two ſtraight pieces of paſteboard regularly divided, the one containing a ſingle, and the other a double alphabet, would anſwer exactly the ſame purpoſe. In this caſe a blank ſpace may be left at each end of the ſingle alphabet, and one or two weights being placed on both the pieces will keep them ſteady.

III. *The correſponding ſpaces.* Take two pieces of paſteboard or ſtiff paper, through which you muſt cut long ſquares, at different diſtances, as you will ſee in the following example. One of theſe pieces you keep yourſelf, and the other you give to your correſpondent. When you would ſend him any ſecret intelligence, you lay the paſteboard upon a paper of the ſame ſize, and in the ſpaces cut out, you write what you would have underſtood by him only, and then fill up the intermedeate ſpaces with ſomewhat that makes with thoſe words a different ſenſe.

|I ſhall be| much obliged to you, as reading |alone| engages my attention |at| preſent, if you will lend me any one of the |eight| volumes of the Spectator. I hope you will excuſe |this| freedom, but for a winter's |evening| I |dont| know a better entertainment. If I |fail| to return it ſoon, never truſt me for the time |to come.|

A paper of this ſort may be placed four different ways, either by putting the bottom at the top, or by turning it over; and by theſe means the ſuperfluous words may be the more eaſily adapted to the ſenſe of the others.

This is a very eligible cipher, as it is free from ſuſpicion, but it will do only for ſhort meſſages; for if the ſpaces be frequent, it will be very difficult to make the concealed and obvious meanings agree together; and if the ſenſe be not clear, the writing will be liable to ſuſpicion.

IV. *The muſical cipher.* The conſtruction of this cipher is ſimilar to that of N° II. The circle EFGH (fig. 3.) is to be divided into twenty-ſix equal parts; in each part there muſt be written one of the letters of the alphabet, and on the anterior circle ILMN, moveable round the centre O, there is to be the ſame number of diviſions: the circumference of the inner circle muſt be ruled in the manner of a muſic paper; and in each diviſion there is to be placed a note, differing either in figure or poſition. Laſtly, within the muſical lines place the three keys, and on the outer circle, the figures that are commonly uſed to denote the time.

Then provide yourſelf with a ruled paper, and place one of the keys, as ſuppoſe that of *ge re ſol,* againſt the time two-fourths at the beginning of the paper, which will inform your correſpondent how to fix his circle, You then copy the notes that anſwer to the ſeveral letters of the words you intend to write, in the manner expreſſed at fig. 5.

A cipher of this ſort may be made more difficult to diſcover by frequently changing the key, and that will not in the leaſt embarraſs the reader. You may likewiſe add the mark ♯ or ♭ to the note that begins a word which will make it more eaſy to read, and at the ſame time give the muſic a more natural aſpect. This cipher is preferable to that of N° II. above, as it may be incloſed in a letter about common affairs, and paſs unſuſpected.

CIPUS, in antiquity, a low column, with an inſcription, erected on the high roads, or other places, to ſhow the way to travellers; to ſerve as a boundary; to mark the grave of a deceaſed perſon, &c.

CIR, St, a village of France, two miles from Verſailles, which was remarkable for a nunnery founded by Louis XIV. The nuns were obliged to take care of the education of 250 girls, who could prove their families to have been noble from the 4th generation on the father's ſide. They could not enter before 7, nor after 12 years of age; and they continued till they were 20 years and three months old. The houſe was formerly a moſt magnificent ſtructure.

CIRCÆA, ENCHANTER'S NIGHT-SHADE. See BOTANY *Index*.

CIRCASSIA, a large country of Aſia, ſituated between 45 and 50 degrees of north latitude, and between 40 and 50 of eaſt longitude. It is bounded by Ruſſia on the north; by Aſtracan and the Caſpian ſea on the eaſt; by Georgia and Dagiſtan on the ſouth; and by the river Don, the Palus Mæotis, and the Black ſea, on the weſt. This country has long been celebrated for the extraordinary beauty of its women; and here it was that the practice of inoculating for the ſmallpox firſt began. Terki, the principal city, is ſeated in a very ſpacious plain, very ſwampy, towards the ſea-ſide, in 43° 23′ north latitude: it is about three werſts in compaſs, well fortified with ramparts and

Circaſſia.

and baſtions in the modern ſtyle, well ſtored with cannon, and has always a conſiderable garriſon in it, under the command of a governor. The Circaſſian prince who reſides here, is allowed 500 Ruſſians for his guard, but none of his own ſubjects are permitted to dwell within any part of the fortifications. Ever ſince the reduction of thoſe parts to the obedience of Ruſſia, they have put in all places of ſtrength, not only Ruſſian garriſons and governors, but magiſtrates, and prieſts for the exerciſe of the Chriſtian religion; yet the Circaſſian Tartars are governed by their own princes, lords, and judges; but theſe adminiſter juſtice in the name of the emperor, and in matters of importance, not without the preſence of the Ruſſian governors, being all obliged to take the oath of allegiance to his imperial majeſty. The apparel of the men of Circaſſia is much the ſame with that of the Nagayans, only their caps are ſomething larger; and their cloaks being likewiſe of coarſe cloth or ſheep ſkins, are faſtened only at the neck with a ſtring, and as they are not large enough to cover the whole body, they turn them round according to the wind and weather. The men here are much better favoured than thoſe of Nagaya, and the women extremely well ſhaped, with exceeding fine features, ſmooth, clear, complexions, and beautiful black eyes, which, with their black hair hanging in two treſſes, one on each ſide the face, give them a moſt lovely appearance. They wear a black coif on their heads, covered with a fine white cloth tied under the chin. During the ſummer they all wear only a ſmock of divers colours, and that open ſo low before, that one may ſee below their navels: this, with their beautiful faces always uncovered (contrary to the cuſtom of moſt of the other provinces in theſe parts), their good humour and lively freedom in converſation, altogether render them very attracting: notwithſtanding which they have the reputation of being very chaſte, though they ſeldom want opportunity; for according to the accounts of a late traveller, it is an eſtabliſhed point of good manners among them, that as ſoon as any perſon comes in to ſpeak to the wife, the huſband goes out of the houſe: but whether this continency of theirs proceeds from their own generoſity, to recompenſe their huſbands for the confidence they put in them, or has its foundation only in fame, he pretends not to determine. Their language they have in common with the other neighbouring Tartars, although the chief people among them are alſo not ignorant of the Ruſſian. Their religion is Paganiſm; for notwithſtanding they uſe circumciſion among them, they have neither prieſt, alcoran, nor moſque, like other Mahometans. Every body here offers his own ſacrifice at pleaſure; for which, however, they have certain days, eſtabliſhed rather by cuſtom than any poſitive command: their moſt ſolemn ſacrifice is offered at the death of their neareſt friends, upon which occaſion both men and women meet in the field to be preſent at the offering, which is a he-goat; and having killed, they flay it, and ſtretch the ſkin with the head and horns on, upon a croſs at the top of a long pole, placed commonly in a quickſet hedge (to keep the cattle from it); and near the place the ſacrifice is offered by boiling and roaſting the fleſh, which they afterwards eat. When the feaſt is over, the men riſe, and having paid their adoration to the ſkin, and muttered over certain prayers, the women withdraw, and the men conclude the ceremony with drinking a great quantity of ſpirits; and this generally ends in a quarrel before they part. The face of the country is pleaſantly diverſified with mountains, valleys, woods, lakes, and rivers; and, though not much cultivated, is far from being unfruitful. In ſummer the inhabitants quit the towns, and encamp in the fields like the neighbouring Tartars, occaſionally ſhifting their ſtations along with their flocks and herds. Beſides game, in which the country greatly abounds, the Circaſſians eat beef and mutton; but that which they prefer to all others is the fleſh of a young horſe. Their bread conſiſts of thin cakes of barley meal, baked upon the hearth, which they always eat new; and their uſual drink is water or mare's milk, from the latter of which they diſtil a ſpirit, as do moſt of the Tartar nations. They allot no fixed hours for the refreſhments of the table or ſleep, which they indulge irregularly, as inclination or convenience dictates. When the men make excurſions into an enemy's country, they paſs ſeveral days and nights ſucceſſively without ſleeping; but, at their return, devote as much time to repoſe as the ſpace in which they had before withheld from that gratification. When they eat, they ſit croſs-legged on the floor, the ſkin of ſome animal ſerving them inſtead of a carpet. In removing from one part of the country to another, the women and children are carried in waggons, which are a kind of travelling houſes, and drawn by oxen or camels: they never uſe horſes for draught. Their breed of the latter, however, is reckoned exceeding good; and they are accuſtomed to ſwim almoſt any river on horſeback. The women and children ſmoke tobacco as well as the men; and this is the moſt acceptable commodity which a traveller can carry with him into the Tartar countries. There are here no public inns, which indeed are unneceſſary; for ſo great is the hoſpitality of the people, that they will contend with each other who ſhall entertain any ſtranger that happens to come among them.—The principal branch of their traffic is their own children, eſpecially their daughters, whom they ſell for the uſe of the ſeraglios in Turkey and Perſia, where they frequently marry to great advantage, and make the fortune of their families. The merchants who come from Conſtantinople to purchaſe thoſe girls, are generally Jews, who, as well as the mothers, are ſaid to be extremely careful of preſerving the chaſtity of the young women, knowing the value that is ſet by the Turks upon the marks of virginity. The greater part of the Circaſſians are Chriſtians of the Greek church; but there are alſo both Mahometans and Pagans among them.

Circaſſia, Circe.

CIRCE, in fabulous hiſtory, a daughter of Sol and Perſeis, celebrated for her knowledge of magic and venomous herbs. She was ſiſter to Æetes king of Colchis, and to Paſiphae the wife of Minos. She married a Sarmatian prince of Colchis, whom ſhe murdered to obtain the kingdom. She was expelled by her ſubjects, and carried by her father upon the coaſts of Italy in an iſland called Ææa. Ulyſſes, at his return from the Trojan war, viſited her coaſts, and all his companions, who ran headlong into pleaſure and voluptuouſneſs, were changed by Circe's potions into filthy ſwine. Ulyſſes, who was fortified againſt all enchantments by an herb called *moly*, which he had received from Mercury, went to Circe, and demanded ſword in hand the reſtoration of his companions to their former ſtate. She complied, and loaded the hero with pleaſures and honours. In this voluptuous retreat Ulyſſes had by Circe one ſon called Telegonus, or two, according to Heſiod, called Agrius and Latinus. For one whole year Ulyſſes forgot his glory in Circe's arms. At his departure the nymph adviſed him to deſcend to hell and to conſult the manes of Tireſias concerning the fates that attended him. Circe ſhowed herſelf cruel to Scylla her rival, and to Picus.

CIRCENSIAN GAMES, a general term under which was comprehended all combats exhibited in the Roman circus, in imitation of the Olympic games in Greece. Moſt of the feaſts of the Romans were accompanied with Circenſian games; and the magiſtrates, and other officers of the republic, frequently preſented the people with them, in order to procure their favour. The grand games were held five days, commencing on the 13th of September. See CIRCUS.

CIRCLE, in *Geometry*, a plane figure comprehended by a ſingle curve line, called its circumference, to which right lines drawn from a point in the middle, called the centre, are equal to each other. See GEOMETRY.

Circles of the Sphere, are ſuch as cut the mundane ſphere, and have their periphery either on its moveable ſurface, or in another immoveable, conterminous, and equidiſtant ſurface. See SPHERE. Hence ariſe two kinds of circles, moveable and immoveable. The firſt, thoſe whoſe peripheries are in the moveable ſurface, and which therefore revolve with its diurnal motion; as, the meridians, &c. The latter having their periphery in the immoveable ſurface, do not revolve; as the ecliptic, equator, and its parallels, &c. See GEOGRAPHY.

Circles of Altitude, otherwiſe called *almucantars*, are circles parallel to the horizon, having their common pole in the zenith, and ſtill diminiſhing as they approach the zenith. See ALMUCANTAR.

Diurnal Circles, are immoveable circles, ſuppoſed to be deſcribed by the ſeven ſtars, and other points of the heavens, in their diurnal rotation round the earth; or rather, in the rotation of the earth round its axis. The diurnal circles are all unequal: the equator is the biggeſt.

Horary Circles, in *Dialing*, are the lines which ſhow the hours on dials; though theſe be not drawn circular, but nearly ſtraight. See DIALING.

Circles of Latitude, or *Secondaries of the Ecliptic*, are great circles parallel to the plane of the ecliptic, paſſing through the poles thereof, and through every ſtar and planet. They are ſo called, becauſe they ſerve to meaſure the latitude of the ſtars, which is nothing but an arch of one of theſe circles intercepted between the ſtar and the ecliptic. See LATITUDE.

Circles of Longitude, are ſeveral leſſer circles, parallel to the ecliptic; ſtill diminiſhing, in proportion as they recede from it. On the arches of theſe circles, the longitude of the ſtars is reckoned.

Circle of perpetual Apparition, one of the leſſer circles, parallel to the equator, deſcribed by any point of the ſphere touching the northern point of the horizon, and carried about with the diurnal motion. All the ſtars included within this circle never ſet, but are ever viſible above the horizon.

Circle of perpetual Occultation, is another circle at a like diſtance from the equator, and contains all thoſe ſtars which never appear in our hemiſphere. The ſtars ſituated between theſe circles alternately riſe and ſet at certain times.

Polar Circles, are immoveable circles, parallel to the equator, and at a diſtance from the poles equal to the greateſt declination of the ecliptic. That next the northern pole is called the ARCTIC; and that next to the ſouthern one the ANTARCTIC.

Fairy Circle. See *Fairy-Circle*.

Druidical Circles, in Britiſh topography, a name given to certain ancient incloſures formed by rude ſtones circularly arranged, in the manner repreſented on Plate CXLV. Theſe, it is now generally agreed, were temples, and many writers think alſo, places of ſolemn aſſemblies for councils or elections, and ſeats of judgment. Mr Borlaſe is of this opinion. "Inſtead, therefore (ſays he), of detaining the reader with a diſpute, whether they were places of worſhip or council, it may with great probability be aſſerted, that they were uſed for both purpoſes; and having for the moſt part been firſt dedicated to religion, naturally became afterwards the curiæ and foræ of the ſame community." Theſe temples, though generally circular, occaſionally differ as well in figure as magnitude: with relation to the firſt, the moſt ſimple were compoſed of one circle: Stonehenge conſiſted of two circles and two ovals, reſpectively concentric, whilſt that at Botalch near St Juſt in Cornwall is formed by four interſecting circles. And the great temple at Avebury in Wiltſhire, it is ſaid, deſcribed the figure of a ſeraph or fiery flying ſerpent, repreſented by circles and right lines. Some beſides circles have avenues of ſtone pillars. Moſt, if not all of them, have pillars or altars within their penetralia or centre. In the article of magnitude and number of ſtones, there is the greateſt variety, ſome circles being only twelve feet diameter and formed only of twelve ſtones, whilſt others, ſuch as Stonehenge and Avebury, contained, the firſt 140, the ſecond 652, and occupied many acres of ground. All theſe different numbers, meaſures, and arrangements had their pretended reference; either to the aſtronomical diviſions of the year, or ſome myſteries of the druidical religion. Mr Borlaſe, however, ſuppoſes, that thoſe very ſmall circles, ſometimes formed of a low bank of earth, ſometimes of ſtones erect, and frequently of looſe ſmall ſtones thrown together in a circular form, incloſing an area of about three yards diameter, without any larger circle round them, were originally places of burial.

CIRCLE, in *Logic*, or *Logical Circle*, is when the ſame terms are proved *in orbem* by the ſame terms; and the parts of the ſyllogiſm alternately by each other, both directly and indirectly.

Circles of the Empire, ſuch provinces and principalities of the German empire as have a right to be preſent at diets. Maximilian I. divided the empire into ſix, and ſome years after into ten circles. This laſt diviſion was confirmed by Charles V. The circles, as they ſtand in the Imperial Matricola, are as follow: Auſtria, Burgundy, the Lower Rhine, Bavaria, Upper

per Saxony, Franconia, Swabia, Upper Rhine, Weſtphalia, and the Lower Saxony.

CIRCONCELLIONES, a ſpecies of fanatics, ſo called becauſe they were continually rambling round the houſes in the country. They took their riſe among the donatiſts in the reign of the emperor Conſtantine. It is incredible what ravages and cruelties theſe vagabonds committed in Africa through a long ſeries of years. They were illiterate ſavage peaſants, who underſtood only the Punic language. Intoxicated with a barbarous zeal, they renounced agriculture, profeſſed continence, and aſſumed the title of "Vindicators of juſtice, and protectors of the oppreſt." To accompliſh their miſſion, they enfranchiſed ſlaves, ſcoured the roads, forced maſters to alight from their chariots, and run before their ſlaves, whom they obliged to mount in their place; and diſcharged debtors, killing the creditors if they refuſed to cancel the bonds. But the chief objects of their cruelty were the Catholics, and eſpecially thoſe who had renounced donatiſm. At firſt they uſed no ſwords, becauſe God had forbidden the uſe of one to Peter; but they were armed with clubs, which they called the *clubs of Iſrael*, and which they handled in ſuch a manner as to break a man's bones without killing him immediately, ſo that he languiſhed a long time and then died. When they took away a man's life at once, they looked upon it as a favour. They became leſs ſcrupulous afterwards, and made uſe of all ſorts of arms. Their ſhout was *Praiſe be to God.* Theſe words in their mouths were the ſignal of ſlaughter, more terrible than the roaring of a lion. They had invented an unheard-of puniſhment; which was to cover with lime diluted with vinegar the eyes of thoſe unhappy wretches whom they had cruſhed with blows, and covered with wounds, and to abandon them in that condition. Never was a ſtronger proof what horrors ſuperſtition can beget in minds deſtitute of knowledge and humanity. Theſe brutes, who had made a vow of chaſtity, gave themſelves up to wine and all ſorts of impurities, running about with women and young girls as drunk as themſelves, whom they called *ſacred virgins*, and who often carried proofs of their incontinence. Their chiefs took the name of *Chiefs of the Saints*. After having glutted themſelves with blood, they turned their rage upon themſelves, and ſought death with the ſame fury with which they gave it to others. Some ſcrambled up to the tops of rocks, and caſt themſelves down headlong in multitudes; others burned themſelves, or threw themſelves into the ſea. Thoſe who propoſed to acquire the title of martyrs, publiſhed it long before, upon which they were feaſted and fattened like oxen for the ſlaughter; after theſe preparations they ſet out to be deſtroyed. Sometimes they gave money to thoſe whom they met, and threatened to murder them if they did not make them martyrs. Theodoret gives an account of a ſtout young man, who meeting with a troop of theſe fanatics, conſented to kill them, provided he might bind them firſt; and having by this means put it out of their power to defend themſelves, whipped them as long as he was able, and then left them tied in that manner. Their biſhops pretended to balance them, but in reality made uſe of them to intimidate ſuch as might be tempted to forſake their ſect; they even honoured them as ſaints. They were not, however, able to govern thoſe furious monſters, and more than once found themſelves under a neceſſity of abandoning them, and even of imploring the aſſiſtance of the ſecular power againſt them. The counts Urſacius and Taurinus were employed to quell them; they deſtroyed a great number of them, of whom the donatiſts made as many martyrs. Urſacius, who was a good Catholic and a religious man, having loſt his life in an engagement with the barbarians, the donatiſts did not fail to triumph in his death, as an effect of the vengeance of heaven. Africa was the theatre of theſe bloody ſcenes during a great part of Conſtantine's life.

CIRCUIT, in *Law*, ſignifies a longer courſe of proceedings than is needful to recover the thing ſued for.

Circuit, alſo ſignifies the journey or progreſs which the judges take twice every year, through the ſeveral counties of England and Wales, to hold courts and adminiſter juſtice, where recourſe cannot be had to the king's courts at Weſtminſter; hence England is divided into ſix circuits, viz. the Home circuit; Norfolk circuit; Midland circuit; Oxford circuit; Weſtern circuit; and Northern circuit. In Wales there are but two circuits, North and South Wales: two judges are aſſigned by the king's commiſſion to every circuit.

In Scotland, the judges of the ſupreme criminal court, or court of juſticiary, are divided into three ſeparate courts, conſiſting of two judges each; and the kingdom into as many diſtricts. In certain boroughs of every diſtrict, each of theſe courts by rotation are obliged to hold two courts in the year, in ſpring and autumn; which are called *circuit-courts*.

Electrical Circuit, denotes the courſe of the electric fluid from the charged ſurface of an electric body, to the oppoſite ſurface into which the diſcharge is made. Some of the firſt electricians apprehend, that the ſame particles of the electric fluid, which were thrown on one ſide of the charged glaſs, actually made the whole circuit of the intervening conductors, and arrived at the oppoſite ſide; whereas Dr Franklin's theory only requires, that the redundancy of electric matter on the charged ſurface ſhould paſs into the bodies forming that part of the circuit which is contiguous to it, driving forward that part of the fluid which they naturally poſſeſs; and that the deficiency of the exhauſted ſurface ſhould be ſupplied by the neighbouring conductors, which form the laſt part of the circuit. On this ſuppoſition, a vibrating motion is ſucceſſively communicated through the whole length of the circuit. This circuit is always formed of the beſt conductors, let the length of it be ever ſo great. Many attempts were made, both in France and England, at an early period in the hiſtory of electricity, to aſcertain the diſtance to which the electric ſhock might be carried, and the velocity of its motion. The French philoſophers, at different times, made it to paſs through a circuit of 900 toiſes, and of 2000 toiſes, or about two Engliſh miles and a half; and they diſcharged the Leyden phial through a baſon of water, the ſurface of which was about an acre. And M. Mounier found, that, in paſſing through an iron wire of 950 toiſes in length, it did not ſpend a quarter of a ſecond ; and that its motion was inſtantaneous through a wire of 1319 feet. In 1747, Dr Watſon, and other Engliſh philoſophers, after many experiments of a ſimilar kind, conveyed the electric matter through a circuit of four miles ; and they concluded from this and another trial, that its velocity is inſtantaneous.

CIRCULAR, in a general ſenſe, any thing that is deſcribed, or moved in a round, as the circumference of a circle, or ſurface of a globe.

Circular Numbers, called alſo *ſpherical ones*, according to ſome, are ſuch whoſe powers terminate in the roots themſelves. Thus, for inſtance, 5 and 6, all whoſe powers do end in 5 and 6, as the ſquare of 5 is 25 ; the ſquare of 6 is 36, &c.

Circular Sailing, is the method of ſailing by the arch of a great circle. See Navigation.

CIRCULATION, the act of moving round, or in a circle ; thus we ſay, the circulation of the blood, &c.

Circulation of the Blood, the natural motion of the blood in a living animal, whereby that fluid is alternately carried from the heart into all parts of the body, by the arteries, from whence it is brought back to the heart again by the veins. See Anatomy *Index*.

In a fœtus, the apparatus for the circulation of the blood is ſomewhat different from that in adults. The ſeptum, which ſeparates the two auricles of the heart, is pierced through with an aperture, called the *foramen ovale ;* and the trunk of the pulmonary artery, a little after it has left the heart, ſends out a tube into the deſcending aorta, called the *communicating canal.* The fœtus being born, the foramen ovale cloſes by degrees, and the canal of communication dries up, and becomes a ſimple ligament.

As to the velocity of the circulating blood, and the time wherein the circulation is completed, ſeveral computations have been made. By Dr Keil's account, the blood is driven out of the heart into the aorta with a velocity which would carry it twenty-five feet in a minute ; but this velocity is continually abated in the progreſs of the blood, in the numerous ſections or branches of the arteries ; ſo that before it arrives at the extremities of the body, its motion is greatly diminiſhed. The ſpace of time wherein the whole maſs of blood ordinarily circulates is variouſly determined. Some ſtate it thus : Suppoſing the heart to make two thouſand pulſes in an hour, and that at every pulſe there is expelled an ounce of blood; as the whole maſs of blood is not ordinarily computed to exceed twenty-four pounds, it muſt be circulated ſeven or eight times over in the ſpace of an hour.

The curious, in microſcopic obſervations, have found an eaſy method of ſeeing the circulation of the blood in the bodies of animals : for theſe inquiries it is neceſſary to chooſe ſuch animals as are ſmall, and eaſily manageable, and which are either wholly or in part tranſparent. The obſervations made by this means are preferable to any others we can have recourſe to, ſince, in diſſections, the animal is in a ſtate of pain, or dying ; whereas in animals ſmall enough to be thus viewed, all is left in its uſual courſe, and we ſee what nature does in her own undiſturbed method. In theſe creatures alſo, after viewing, as long as we pleaſe, the natural ſtate and current of the blood, we may, by preſſure, and ſeveral other ways, impede its courſe ; and by putting various mixtures into the creature's water, induce a morbid ſtate, and finally ſee the creature die, either by means of this or by any other method ; and we may thus accurately obſerve all the changes it undergoes, and ſee what occaſions the trembling pulſe, &c. of dying people.

The current of the blood in ſmall animals, that is, its paſſing on through the veſſels, either to or from the heart, is very eaſily ſeen by the microſcope ; but its circulation, that is, its running to the extremities of the parts, and thence returning, is more difficult ; becauſe the veſſels where this ſhould be ſeen are ſo extremely minute, as not eaſily to come under obſervation. The larger arteries are eaſily diſtinguiſhed from the veins by the motion of the blood through them, which in the veins is always ſmooth and regular ; but in the arteries, by ſeveral propulſions after the manner of pulſation. But this difference is not to be found in the more minute veſſels, in all which, as well arteries as veins, the motion of the blood is even and regular.

The tranſparent membrane, or web between the toes of a frog's hinder foot, is a very proper object to obſerve the circulation of the blood in. The tails or fins of fiſhes are alſo very fine objects ; and when the fiſh is very ſmall, theſe are manageable, and afford a view of a great number of veins and arteries, with a very quick and beautiful ſucceſſion of blood through them. The tail of a flounder may be very conveniently placed before the double microſcope on a plate of glaſs ; and its body being ſupported by ſomething of equal height, the fiſh will lie ſtill, and the circulation may be ſeen very agreeably. In the minuteſt veſſels thus examined, the blood always appears pale or colourleſs, but in the large ones it is manifeſtly red. The arteries uſually branch out extremely before they join the veins to carry the blood back to the heart ; but this is not always the caſe ; for Mr Leuwenhoeck has obſerved, that on each ſide of the little griſtles which give a ſtiffneſs to the tail of a flounder, there may be ſeen a very open communication of the veins and arteries ; the blood running towards the extremities through arteries, and returning back again through veins, which were evidently a continuation of thoſe arteries, and of the ſame diameter with them. The whole fiſh on the tail of which this examination was made, was not more than half an inch in length ; it is eaſy to conceive, therefore, how ſmall the tail muſt be ; and yet in it there were 68 veſſels which carried and returned the blood ; and yet theſe veſſels were far from being the moſt minute of all. How inconceivably numerous then muſt the *circulations* in the whole human body be ? Mr Leuwenhoeck is of opinion, that a thouſand different circulations are continually carried on in every part of a man's body in the breadth of a finger nail.

The tail of a newt or water-lizard affords alſo a very entertaining proſpect of the circulation of the blood through almoſt numberleſs ſmall veſſels ; but no object ſhows it ſo agreeably as one of theſe animals while ſo young as not to be above an inch long ; for then the whole body is ſo very tranſparent, that the circulation may be ſeen in every part of it, as well as in the tail; and, in theſe objects, nothing is more beautiful than the courſe of the blood into the toes and back again, where it may be traced all the way with great eaſe. Near the head there are alſo found three ſmall fins which afford a very delightful proſpect: theſe are all divided like the leaves of polypody; and in every one of the branches of theſe, the blood may be very accurately traced, running to the end through the artery, and there returning back again by a vein of the ſame ſize, and laid in the ſame direction; and as the veſſels are very numerous and large in this part, and the third or fourth magnifier may be uſed, there are ſometimes ſeen 30 or 40 channels of running blood at once; and this the more as the globules of blood in the newt are large, and fewer in number, in proportion to the quantity of ſerum than in any other animal: and their figure, as they are protruded through the veſſels, changes in a very ſurpriſing manner. The impetus occaſioning the circulation is great enough in ſome animals to raiſe the blood ſix, ſeven, or eight feet high from the blood-veſſel it ſprings out at, which, however, is far exceeded by that of the ſap of a vine in bleeding time, which will ſometimes riſe 40 feet high.

Circulation of the ſap of Plants. See Plants and Sap.

Circulation of the Spirits, or Nervous Fluid. See Anatomy *Index*.

Circulation, in *Chemiſtry*, is an operation whereby the ſame vapour, raiſed by fire, falls back, to be returned and diſtilled ſeveral times.

Circulation of Money. See Commerce and Money.

Subterranean Circulation. See Springs.

CIRCULUS, in *Chemiſtry*, an iron inſtrument in form of a ring, which being heated red hot, and applied to the necks of retorts and other glaſs veſſels till they grew hot, a few drops of cold water thrown upon them, or a cold blaſt, will make the necks fly regularly and evenly off.

Another method of doing this is, to tie a thread, firſt dipt in oil of turpentine, round the place where you would have it break; and then ſetting fire to the thread, and afterwards ſprinkling the place with cold water, the glaſs will crack exactly where the thread was tied.

CIRCUMAMBIENT, an appellation given to a thing that ſurrounds another on all ſides; chiefly uſed in ſpeaking of the air.

CIRCUMCELLIONES. See Circoncelliones.

CIRCUMCISION, the act of cutting off the prepuce; a ceremony in the Jewiſh and Mahometan religions, wherein they cut off the foreſkin of their males, who are to profeſs the one or the other law.

Circumciſion commenced in the time of Abraham; and was the ſeal of a covenant ſtipulated between God and him. It was in the year of the world 2178 that Abraham, by divine appointment, circumciſed himſelf and all the males of his family; from which time it became an hereditary practice among his deſcendants.

The ceremony, however, was not confined to the Jews. Herodotus and Philo Judæus obſerve, that it obtained alſo among the Egyptians and Ethiopians. Herodotus ſays, that the cuſtom was very ancient among each people; ſo that there was no determining which of them borrowed it from the other. The ſame hiſtorian relates, that the inhabitants of Colchis alſo uſed circumciſion; whence he concludes, that they were originally Egyptians. He adds, that the Phœnicians and Syrians were likewiſe circumciſed; that they borrowed the practice from the Egyptians; and, laſtly, that a little before the time when he wrote, circumciſion had paſſed from Colchis, to the people inhabiting near Thermodon and Parthenius.

Marſham is of opinion, that the Hebrews borrowed circumciſion from the Egyptians; and that God was not the firſt author thereof, citing Diodorus Siculus and Herodotus as evidences on his ſide. This latter propoſition ſeems directly contrary to the teſtimony of Moſes, who aſſures us (Gen. xvii.), that Abraham, though 99 years of age, was not circumciſed till he had the expreſs command of God for it. But as to the former poſition of Marſham, it will admit of more debate. The arguments on both ſides may be ſeen in one view in *Spencer de Legibus Hebræorum*, l. 2. c. 4.

Be this as it will, it is certain the practice of circumciſion among the Hebrews differed very conſiderably from that of the Egyptians. Among the firſt it was a ceremony of religion, and was performed on the eighth day after the birth of the child. Among the latter, a point of mere decency and cleanlineſs; and, as ſome will have it, of phyſical neceſſity; and was not performed till the 13th year, and then on girls as well as boys.

Among the Jews, the time for performing this rite was the eighth day, that is, ſix full days, after the child was born. The law of Moſes ordained nothing with reſpect to the perſon by whom, the inſtrument with which, or the manner how, the ceremony was to be performed; the inſtrument was generally a knife of ſtone. The child is uſually circumciſed at home, where the father or godfather holds him in his arms, while the operator takes hold of the prepuce with one hand, and with the other cuts it off; a third perſon holds a porringer, with ſand in it, to catch the blood; then the operator applies his mouth to the part, and, having ſucked the blood, ſpits it into a bowl of wine, and throws a ſtyptic powder upon the wound. This ceremony was uſually accompanied with great rejoicings and feaſting; and it was at this time that the child was named in preſence of the company. The Jews invented ſeveral ſuperſtitious cuſtoms at this ceremony, ſuch as placing three ſtools, one for the circumciſor, the ſecond for the perſon who holds the child, and the third for Elijah, who, they ſay, aſſiſts inviſibly at the ceremony, &c.

The Jews diſtinguiſhed their poſelytes into two ſorts, according as they became circumciſed or not: thoſe who ſubmitted to this rite were looked upon as children of Abraham, and obliged to keep the laws of Moſes; the uncircumciſed were only bound to obſerve the precepts of Noah, and were called *Noachidæ*.

The Turks never circumciſe till the ſeventh or eighth year, as having no notion of its being neceſſary to ſalvation. The Perſians circumciſe their boys at 13, and their girls from 9 to 15. Thoſe of Madagaſcar cut the fleſh at three ſeveral times, and the moſt zealous of the relations preſent catches hold of the preputium and ſwallows it.

Circumciſion is practiſed on women by cutting off the foreſkin of the clitoris, which bears a near reſemblance and analogy to the preputium of the male penis. We are told that the Egyptian captive-women were circumciſed; and alſo the ſubjects of Preſter John.

Circumcision is alſo the name of a feaſt, celebrated on the firſt of January, in commemoration of the circumciſion of our Saviour.

CIRCUMDUCTION, in *Scots Law.* When parties in a ſuit are allowed a proof of alledgeances; after the time limited by the judge for taking that proof is elapſed, either party may apply for circumduction of the time of proving; the effect of which is, that no proof can afterwards be brought, and the cauſe muſt be determined as it ſtood when circumduction was obtained.

CIRCUMFERENCE, in a general ſenſe, denotes the line or lines bounding a plane figure. However, it is generally uſed in a more limited ſenſe for the curve line which bounds a circle, and otherwiſe called a *periphery;* the boundary of a right-lined figure being expreſſed by the term *perimeter.*

CIRCUMFERENTOR, an inſtrument uſed by ſurveyors for taking angles.

Plate CXLV. It conſiſts of a braſs index and circle, all of a piece. The index is commonly about 14 inches long, and an inch and a half broad; the diameter of the circle is about ſeven inches. On this circle is made a chart, whoſe meridian line anſwers to the middle of the breadth of the index, and is divided into 360 degrees. There is a braſs ring ſoldered on the circumference of the circle, on which ſcrews another ring, with a flat glaſs in it, ſo as to form a kind of box for the needle, ſuſpended on the pivot in the centre of the circle. There are alſo two ſights to ſcrew on, and ſlide up and down the index, as alſo a ſpangle and ſocket ſcrewed on the back ſide of the circle for putting the head of the ſtaff in.

Ibid. *How to obſerve the Quantity of an angle by the Circumferentor.* Let it be required to find the quantity of the angle EKG; firſt place your inſtrument at K, with the flower-de-luce of the chart towards you; then direct your ſights to E, and obſerve what degrees are cut by the ſouth end of the needle, which let be 296; then, turning the inſtrument about, direct your ſights to G, noting then alſo what degrees are cut by the ſouth end of the needle, which ſuppoſe 247. This done, always ſubtract the leſſer from the greater, as in this example, 247 from 296, the remainder is 49 degrees, which is the true quantity of the angle EKG.

Ibid. A circumferentor was made by Mr Jones of Holborn on an improved conſtruction. From a very ſimple contrivance, it is rendered ſufficient to take angles with the accuracy of a common theodolite; and by it angles of altitude and depreſſion may be obſerved as readily as horizontal ones. The improvement chiefly conſiſts in an arm or index (G), ſo applied to the centre of the compaſs box, and within it, that, at the time of obſerving, by only ſlipping a pin (*p*) out, the circle of degrees alone may move round, and leave the index (G) fixed. This index will remain ſtationary, from its being attached to the ſocket that ſcrews on the head of the ſtaffs. On the end of this index, next the degrees in the box, there is graduated a nonius ſcale, by which the circle of 360 degrees is ſubdivided into five minutes or leſs if deſired. To take angles of altitude or depreſſions, the inſtrument is turned down on its ball and ſocket into a perpendicular poſition, and adjuſted to its level by a plumb line (*l*), that is hung on a pin at the back of the box, and made to coincide with a mark made thereon. Then by looking through the ſmall ſight holes (*s*) purpoſely made, the angles are ſhown on the circle of degrees by the nonius as before. The arms (AA) of the inſtrument ſlip off (at BB), and the whole packs into a caſe but 5½ inches ſquare and 3 deep.

CIRCUMFLEX, in *Grammar*, an accent, ſerving to note, or diſtinguiſh, a ſyllable of an intermediate ſound between acute and grave; and generally ſomewhat long.—The Greeks had three accents, the acute, the grave, and the circumflex; formed thus, ´, `, ῀, In Latin, Engliſh, French, &c. the circumflex is made thus ^.—The acute raiſes the voice, and the grave falls or lowers it: the circumflex is a kind of undulation, or wavering of the voice, between the two. It is ſeldom uſed among the moderns, unleſs to ſhow the omiſſion of a letter which made the ſyllable long and open; a thing much more frequent in the French than among us: thus they write *pâte* for *paſte; tête* for *teſte; fûmes* for *fuſmes*, &c. They alſo uſe the circumflex in the participles; ſome of their authors writing *conneu, peu,* others *connû, pû,* &c. Father Buffier is at a loſs for the reaſon of the circumflex on this occaſion.

The form of the Greek circumflex was anciently the ſame with that of ours, viz. ^; being a compoſition of the other two accents ʌ in one.—But the copiiſts, changing the form of the characters, and introducing the running hand, changed alſo the form of the circumflex accent; and inſtead of making a juſt angle, rounded it off, adding a daſh, through too much haſte; and thus formed an *s*, laid horizontally, which produced this figure ῀, inſtead of this ^.

CIRCUMGYRATION, denotes the whirling motion of any body round a centre; ſuch is that of the planets round the ſun.

CIRCUMLOCUTION, an ambages, or tour of words, uſed either when a proper term is not at hand, to expreſs a thing naturally and immediately by; or when one chooſes not to do it, out of reſpect, or for ſome other reaſon. The word comes from *circumloquor*, "I ſpeak about."

Circumlocution, in oratory, is the avoiding of ſomething diſagreeable or inconvenient to be expreſſed in direct terms; by intimating the ſenſe thereof in a kind of paraphraſe, ſo conceived as to ſoften or break the force thereof.

Thus Cicero, unable to deny that Clodius was ſlain by Milo, owns it, with this circumlocution, "Milo's "ſervants being prevented from aſſiſting their maſter, "who was reported to be killed by Clodius; they, in "his abſence, and without his privity, or conſent, did "what every body would expect from their own ſer"vants on ſuch an occaſion."

CIRCUMPOLAR STARS, an appellation given to thoſe ſtars, which, by reaſon of their vicinity to the pole, move round it without ſetting.

CIRCUMPOTATIO, in antiquity, a funeral feaſt provided in honour of the dead. This was very frequent among the ancient Romans, as well as among the Athenians. Solon at Athens, and the decemviri at Rome, endeavoured to reform this cuſtom, thinking it abſurd that mirth and drunkenneſs ſhould mingle with ſorrow and grief.

CIRCUMSCRIBED, in *Geometry*, is ſaid of a figure which is drawn round another figure, ſo that all its ſides or planes touch the inſcribed figure.

CIRCUMSCRIPTION, in *Natural Philoſophy*, the termination, bounds, or limits, of any natural body.

CIRCUMSTANCE, a particularity, which, though not eſſential to any action, yet doth ſome way affect it.

CIRCUMSTANTIAL EVIDENCE, in *Law*, or the doctrine of preſumption, takes place next to poſitive proof: circumſtances which either neceſſarily or uſually attend facts of a particular nature, that cannot be demonſtratively evinced, are called *preſumptions*, and are only to be relied on till the contrary be actually proved.

CIRCUMSTANTIBUS, in *Law*, a term uſed for ſupplying and making up the number of jurors, (in caſe any impanelled appear not, or appearing are challenged by any party), by adding to them ſo many of the perſons preſent as will make up the number, in caſe they are properly qualified.

CIRCUMVALLATION, or *Line of* CIRCUMVALLATION, in the art of war, is a trench bordered with a parapet, thrown up quite round the beſieger's camp, by way of ſecurity againſt any army that may attempt to relieve the place, as well as to prevent deſertion.

CIRCUMVOLUTION, in *Architecture*, denotes the torus of the ſpiral line of the Ionic order.

CIRCUS, in antiquity, a large building, either round or oval, uſed for the exhibiting of ſhows to the people. Some derive the word from *Circe*, to whom Tertullian attributes the invention. Caſſiodorus ſays, *Circus* comes *à circuitu*. The Romans, Servius obſerves, at firſt had no other circus but that made by the Tiber on one ſide, and a paliſade of naked ſwords on the other. Hence, according to Iſidore, came the term *ludi circenſes*, *quaſi circum enſes* But Scaliger ridicules that etymology.

The Roman circus was a large oblong edifice, arched at one end, encompaſſed with porticoes, and furniſhed with rows of ſeats, placed aſcending over each other. In the middle was a kind of foot-bank, or eminence, with obeliſks, ſtatues, and poſts at each end. This ſerved them for the courſes of their *bigæ* and *quadrigæ*. There were no leſs than ten circuſes at Rome: The largeſt was built by the elder Tarquin, called *Circus Maximus*, between the Aventine and Palatine mounts. It was ſo called, either becauſe of its vaſt circumference, or becauſe the great games were celebrated in it; or again, becauſe it was conſecrated to the great gods, viz. to Vertumnus, Neptune, Jupiter, Juno, Minerva, and the Dii Penates of Rome. Dionyſius Halicarnaſſenſis ſays that its was three ſtadia and a half in length, and four jugera broad; and theſe meaſures, according to Pliny, allowing to the Roman ſtadia 625 Roman feet, each of which is 12 inches, will give for the length, 2187 Roman feet, or ſomewhat more than three Engliſh furlongs; and as to the breadth, allowing for each of the jugera 240 Roman feet, it will be 960 Roman feet. It was beautified and enlarged by the Roman emperors, ſo as to ſeat 250,000 ſpectators. The moſt magnificent circuſes were thoſe of Auguſtus and Nero. There are ſtill ſome remains of the circuſes at Rome, at Niſmes, and other places. The Romans were exceſſively fond of the games exhibited in the circus: witneſs that verſe in Juvenal,

> —— *Atque duas tantum res anxius optat,*
> *Panem et circenſes.* —— —— ——

The Games of the CIRCUS, which ſome call *Circenſian Games*, were combats celebrated in the circus, in honour of Conſus the god of councils; and thence alſo called *Conſualia*. They were alſo called *Roman Games*, *Ludi Romani*, either on account of their antiquity, as being coeval with the Roman people, or becauſe eſtabliſhed by the Romans; and the games held there, the great games, *ludi magni*, becauſe celebrated with more expence and magnificence than others; and becauſe held in honour of the great god Neptune, who was their Conſus.—Thoſe who ſay they were inſtituted in honour of the ſun, confound the *pompa circenſis*, or proceſſion of the circus, with the games.

The games of the circus were inſtituted by Evander, and re-eſtabliſhed by Romulus: the pomp, or proceſſion, was only a part of the games, making the prelude thereof, and conſiſting of a ſimple cavalcade of chariots. Till the time of the elder Tarquin, they were held in an iſland of the Tiber; and were called *Roman games*: after that prince had built the circus, they took their name therefrom, as being conſtantly held there. There were ſix kinds of exerciſes in the circus: the firſt was wreſtling, and fighting with ſwords, with ſtaves, and with pikes; the ſecond was racing; the third, ſaltatio, leaping; the fourth, diſci, quoits, arrows, and ceſtus; all which were on foot: the fifth was horſe-courſing; the ſixth, courſes of chariots, whether with two horſes or with four. In this laſt exerciſe, the combatants were at firſt divided into two ſquadrons or quadrils; then into four; each bearing the names of the colours they wore; *factio alba*, *ruſſea*, &c. At firſt there were only white and red; then green and blue were added. Domitian added two more colours, but they did not continue. It was Oenomaus who firſt invented this method of diſtinguiſhing the quadrils by colours. The green was for thoſe who repreſented the earth; the blue for the ſea, &c.

CIRENCESTER, an ancient town of Glouceſterſhire in England. It was ſtrongly fortified with walls and a caſtle in the time of the Romans. The ruins of the walls and ſtreets are, or were lately, to be ſeen in the adjacent meadows, where many Roman coins, chequered pavements, and inſcriptions on marble, have been found. Two of the Roman conſular ways croſs each other at this town. The foſſe-way, which comes from Scotland, paſſes through this county and town to Totneſs in Devonſhire. The other, called *Irmin-ſtreet*, comes from Glouceſter, and runs along to South-ampton. Not many years ago they diſcovered, by digging in a meadow near the town, an ancient building under ground, 50 feet long, 40 broad, and 4 high, and ſupported by 100 brick pillars, curiouſly inlaid with ſtones of various colours, ſuppoſed to have been a Roman bath. Cirenceſter has now but one church, in the windows of which are the remains of very valuable painted glaſs. The town is governed by two high conſtables, and 14 wards-men, who govern ſeven diſtinct wards; and it ſends two members to parliament. It has a free ſchool, a charity-ſchool, with ſeveral alms houſes; and is ſeated on the river Churn, 36 miles north-eaſt of Briſtol, and 88 weſt by north of London. W. Long. 0. 2. N. Lat. 51. 42.

CIRENZA, a city of Naples, capital of the Baſilicate, with an archbiſhop's ſee. It was formerly a conſiderable place, but is now of ſmall conſequence. It is ſituated on the river Brandano, at the foot of the Apennine mountains, in E. Long. 16. 44. N. Lat. 40. 48.

CIRO FERRI, an excellent Italian painter and architect, was born at Rome in 1614, and was the diſciple of Peter de Cortona, whoſe deſigns he imitated with ſuch exactneſs, that it is difficult to diſtinguiſh them. He was eſteemed by Pope Alexander VII. and his three ſucceſſors, and died at Rome in 1689.

CIRRUS, or CIRRHUS, in *Botany*, a claſper or tendril; that fine ſpiral ſtring or fibre put out from the footſtalks, by which ſome plants, as the ivy and vine, faſten themſelves to walls, pales, or trees, for ſupport. The term is ſynonymous to the capreolus, clavicula, and viticulus of other botaniſts; and is ranked by Linnæus among the fulcra, or parts of plants that ſerve for protection, ſupport, and defence.

Tendrils are ſometimes placed oppoſite to the leaves, as in the vine; ſometimes at the ſide of the footſtalk of the leaf, as in the paſſion flower; and ſometimes, as in winged pea, *piſum ochrus*, they are emitted from the leaves themſelves. With reſpect to compoſition, they are either ſimple, that is, compoſed of one fibre or chord, as in the vetch; or compound, that is, conſiſt of two, three, or more, as in the everlaſting pea. Bitter ſweet, *ſolanum dulcamara*, bignonia, and ivy, ſend forth tendrils which plant themſelves like roots in the adjacent walls, or the bark of the neighbouring trees. Claſpers, ſays the ingenious Dr Grew, are like trunk roots, a mean betwixt a root and a trunk, but a compound of both, as may be gathered from their circumvolutions, in which they mutually aſcend and deſcend. In the mounting of the trunk, continues the ſame author, claſpers ſerve for ſupport. Thus, in vines, the branches being very long, fragile, and ſlender, would be liable to frequent breaking, unleſs, by means of their claſpers, they were mutually contained together; ſo that the whole care is divided betwixt the gardener and nature: the former, with his ligaments of leather, ſecures the main branches; and nature, with thoſe of her own providing, ſecures the leſs. Their aptitude to this end is ſeen in their convolutions, a motion not proper to any other part; and alſo in their toughneſs, which is ſo much the more remarkable, as they are ſlenderer than the branches from which they proceed. In the trailing of the trunk, tendrils ſerve for ſtabilement and ſhade: thus, in cucumbers, the trunk and branches being long and fragile, would be driven to and fro by the winds, to the great prejudice both of themſelves and their tender fruits, were they not, by theſe ligaments, held faſt together, and preſerved in aſſociation and good fellowſhip. The ſame claſpers ſerve likewiſe for ſhade, ſo that a natural arbour is formed by the branches of the cucumber, in the ſame manner as an artificial one is made by tangling together the twigs of trees, for the branches, by the linking of the claſpers, being couched together, the tender fruits lie under the umbrage of a bower made of their own leaves. Moſt of the pea-bloom flowers have twining claſpers, that is, which wind to the right and back again.

CIRRI, in *Ichthyology*, certain oblong and ſoft appendages, not unlike little worms, hanging from the under jaws or mouths of ſome fiſhes: theſe cirri, commonly tranſlated *beards*, afford marks to diſtinguiſh the different ſpecies of the fiſhes on which they are found.

CIRTA, in *Ancient Geography*, the metropolis and royal reſidence, not far from the river Ampſaga, in the inland parts of Numidia Propria. A colony, ſurnamed *Colonia Sittianorum*, very rich, when in the hands of Cyphax. The colony was led by one P. Sittius, under the auſpices of Cæſar, and was ſurnamed *Julia*. Now called *Conſtantina*, in Algiers. E. Long. 7. 0. N. Lat. 35. 30.

CISALPINE, any thing on this ſide the Alps. The Romans divided Gaul and the country now called *Lombardy*, into Ciſalpine and Tranſalpine. That which was Ciſalpine with regard to the Romans, is Tranſalpine with regard to us.

CISLEU, in Hebrew chronology, the ninth month of their eccleſiaſtical, and third of their civil, year, anſwering nearly to our November.

CISPADANA GALLIA, in *Ancient Geography*; a diſtrict of Italy, to the ſouth of the Po, occupied by the Gauls in the time of the kings of Rome, ſeparated from Liguria on the weſt, as is thought by the Iria, running from ſouth to north into the Po; bounded on the ſouth by the Apennine, and on the eaſt by the Adriatic. The term is formed analogically, there being much mention in Cicero, Tacitus, Suetonius, and ancient inſcriptions, made of the *Tranſpadani*; which and *Ciſpadani* are terms uſed with reſpect to Rome. Ptolemy calls the *Ciſpadana* peculiarly *Gallia Togata*, extending between the Po and Apennine, to the Sapis and Rubicon.

CISSA, or CISSUM, in *Ancient Geography*, a town of the Hither Spain, in Lacetania, on the eaſt ſide of the Iberus (thought to be *Guiſſona*), where the Carthaginians were firſt defeated by Scipio. Another *Ciſſa* of Thrace, ſituated on the river Ægos Potamus, which Scylax ſeems to call *Creſſa*, or *Criſſa*; ſo that the reading is doubtful.

CISSAMPELOS. See BOTANY *Index*. There are two ſpecies of this genus, the pareira and caapeba, both natives of the warmeſt parts of America. The root of the ſecond, applied externally, is ſaid to be an antidote againſt the bites of venomous ſerpents. The plant being infuſed in water, quickly fills the liquor with a mucilaginous ſubſtance, which is as thick as jelly; whence the name of *freezing-wyth*, by which this genus of plants has been diſtinguiſhed by the Brazilians.

CISSOID, in *Geometry*, a curve of the ſecond order, firſt invented by Diocles, whence it is called *the ciſſoid of Diocles*. See Fluxions.

CISSUS, the wild-grape. See Botany *Index*.

CISTERCIANS, in *Church-hiſtory*, a religious order founded in the 11th century by St Robert, a Benedictine. They became ſo powerful, that they governed almoſt all Europe, both in ſpirituals and temporals. Cardinal de Vitri deſcribing their obſervances, ſays, they neither wore ſkins nor ſhirts, nor ever ate fleſh, except in ſickneſs; and abſtained from fiſh, eggs, milk, and cheeſe: they lay upon ſtraw-beds, in tunics and cowls; they roſe at midnight to prayers; they ſpent the day in labour, reading, and prayer, and in all their exerciſes obſerved a continual ſilence. The habit of the Ciſtercian monks is a white robe, in the nature of a caſſock, with a black ſcapulary and hood, and is girt with a wooden girdle. The nuns wear a white tunic, and a black ſcapulary and girdle.

CISTERN, denotes a ſubterraneous reſervoir of rain-water; or a veſſel ſerving as a receptacle for rain or other water, for the neceſſary uſes of a family. There are likewiſe lead-ciſterns, jar-ciſterns, &c.

Authors mention a ciſtern at Conſtantinople, the vaults of which are ſupported by two rows of pillars, 212 in each row, each pillar being two feet in diameter. They are planted circularly, and *in radii* tending to that of the centre.

Anciently there were ciſterns all over the country in Paleſtine. There were ſome likewiſe in cities and private houſes. As the cities for the moſt part were built on mountains, and the rains fell regularly in Judea at two ſeaſons in the year only, in ſpring and autumn, people were obliged to keep water in ciſterns in the country for the uſe of their cattle, and in cities for the conveniency of the inhabitants. There are ſtill ciſterns of very large dimenſions to be ſeen in Paleſtine, ſome whereof are 150 paces long, and 54 wide. There is one to be ſeen at Ramah of 32 paces in length, and 28 in breadth. Wells and ciſterns, ſprings and fountains, are generally confounded in ſcripture-language.

CISTUS, the Rock-rose. See Botany *Index*.

CITADEL, a place fortified with five or ſix baſtions, built on a convenient ground near a city, that it may command it in caſe of a rebellion.

CITADELLA, the capital town in the iſland of Minorca, in the Mediterranean, with a new harbour. This, with the whole iſland, were taken by General Stanhope and the confederate fleet in 1708, and ceded to Great Britain by the treaty of Utrecht in 1713; but it was taken by the French, after a brave defence, in 1756, and reſtored by the peace. In 1782, it was taken by the Spaniards, and confirmed to them at the ſubſequent peace. It is 27 miles weſt of Port-Mahon. E. Long. 3. 30. N. Lat. 39. 58.

CITADINESCA, in *Natural Hiſtory*, a name given by ſome writers to the Florentine marble, which is ſuppoſed to repreſent towns, palaces, ruins, rivers, &c. Theſe delineations are merely accidental, and are commonly much aſſiſted by the imagination, though the natural lines of a ſtone may ſometimes luckily enough repreſent the ruins of ſome ancient building, or the courſe of a river. In England there is a kind of ſeptaria, or ludus Helmontii, which has ſometimes pretty beautiful, though very irregular, delineations of this kind. The Florentine marble, as we ſee it wrought up in the ornaments of cabinets, &c. owes a great deal to the ſkill of the workmen, who always pick out the proper pieces from the maſs, and diſpoſe them in the work ſo as to repreſent what they pleaſe.

CITATION, in eccleſiaſtical courts, is the ſame with ſummons in civil courts. See Summons.

Citation, is alſo a quotation of ſome law authority, or paſſage of a book.

CITHÆRON, in *Ancient Geography*, a mountain and foreſt of Bœotia, celebrated both in fable and ſong. To the weſt it ran obliquely, a little above the Sinus Criſſæus, taking its riſe contiguous to the mountains of Megara and Attica; then levelled into plains, it terminates at Thebes, famous for the fate of Pentheus and Actæon; the former torn by the Bacchæ, the latter by his dogs; as alſo for the *orgia*, or revels of Bacchus.

CITHARA, in antiquity, a muſical inſtrument, the preciſe ſtructure of which is not known; ſome think it reſembled the Greek delta Δ; and others the ſhape of a half-moon. At firſt it had only three ſtrings, but the number was at different times increaſed to 8, to 9, and laſtly to 24. It was uſed in entertainments and private houſes, and played upon with a plectrum or quill, like the lyre.

CITHAREXYLON, fiddle-wood. See Botany *Index*.

CITIUM, Cetium, or *Cittium*, in *Ancient Geography*, a town of Cyprus, ſituated in the ſouth of the iſland, famous for the birth of Zeno, author of the ſect called *Stoics;* diſtant two hundred ſtadia to the weſt of Salamis (Diodorus Siculus). A colony of Phœnicians, called *Chetim:* And hence it is that not only Cyprus, but the other iſlands and many maritime places, are called *Chetim* by the Hebrews; now called *Chiti*.

CITIZEN, a native or inhabitant of a city, veſted with the freedom and liberties of it.

A citizen of Rome was diſtinguiſhed from a ſtranger, becauſe he belonged to no certain commonwealth ſubject to the Romans. A citizen is either by birth or election; and ſons may derive the right from their fathers. To make a good Roman citizen, it was neceſſary to be an inhabitant of Rome, to be inrolled in one of the tribes, and to be capable of dignities. Thoſe to whom were granted the rights and privileges of Roman citizens were only honorary citizens. It was not lawful to ſcourge a citizen of Rome.

CITRINUS, in *Natural Hiſtory*, the name of a peculiar ſpecies of ſprig cryſtal, which is of a beautiful yellow. Many of the common cryſtals, when in the neighbourhood of lead mines, are liable to be accidentally tinged yellow, by an admixture of the particles of that metal; and all theſe, whether finer or coarſer, have been too frequently confounded together under the name *citrine;* but Dr Hill has aſcertained this to be a peculiar ſpecies of cryſtal different from all the others in form as well as in colour; and diſtinguiſhed by the name of *ellipomacroſtylum lucidum ſla-*

veſcens, pyramide brevi. It is never found colourleſs like the other cryſtals, but has great variety of tinges, from that of the deeper ochres to a pale lemon-colour. It is very plentiful in the Weſt Indies, and is ſometimes found in Bohemia. Our jewellers have learned from the French and Italians, who are very fond of it, to call it *citrine;* and often cut ſtones for rings out of it, particularly out of the pyramid, which is always finer than the column; and theſe, after they have paſſed through two or three hands, are generally miſtaken for topazes.

CITRON-tree. See Citrus, Botany *Index.*

Citron-Water, a well-known ſtrong water or cordial, which may be thus made: Take of fine thin lemon-peel, 18 ounces; of orange-peel, 9 ounces; perfect nutmegs, 4 ounces; the fineſt and beſt alcohol 2 gallons and a half. Digeſt in balneo mariæ for one night: draw off with a ſlow fire; then add as much water as will juſt make the matter milky (which will be about 7 quarts or 2 gallons); and laſtly, add 2 pounds of fine ſugar. This compoſition may be improved by freſh elder flowers, hung in a cloth in the head of the ſtill, ſprinkled with ambergris in powder, or its eſſence.

Citron-Wood, the wood of an American tree, called by the natives *candle-wood,* becauſe, being cut into ſplinters, it burns like a candle. The tree is frequent in the Leeward Iſlands, and grows to a conſiderable ſize: the leaves are like thoſe of the bay-tree, but of a finer green; the flower is ſweet, and much like thoſe of the orange; the fruit ſucceeding theſe is black, and of the ſize of a pepper-corn. The trunk is ſo like the yellow ſaunders in colour, that there was once an opinion that it was the ſame tree, and much of it was imported into Europe, and ſold as ſuch; but they were ſoon found to be different; the ſaunders being of a ſweet ſcent, and but moderately heavy and reſinous: but the citron-wood conſiderably heavy, very oily, and of a ſtrong ſmell. It is of no known uſe in medicine; but is uſed in France and Germany by the turners, being a fine firm-grained wood, and taking a fine poliſh, and with age becoming of a very beautiful brown.

CITRUS, the citron-tree. See Botany *Index.* This genus includes the citron, the lemon, the lime, the orange, of which there are different varieties, the ſhaddock, and the forbidden fruit.

CITTERN, a muſical inſtrument much reſembling the guittar, for which it has been frequently miſtaken. Anciently it was called the *ciſtrum,* and till lately was held in great contempt both in France and Britain. The practice on it being very eaſy, it was formerly the amuſement and recreation of lewd women and their viſitors, inſomuch, that in many of the old Engliſh dramatic writers, it is made the ſymbol of a woman that lived by proſtitution. It was alſo the common amuſement of waiting cuſtomers in barbers ſhops, as being the moſt eaſy of all inſtruments to play on, and therefore it was thought that almoſt every body could make uſe of it.

CITY, according to Cowel, is a town corporate which hath a biſhop and cathedral church; and is called *civitas, oppidum,* and *urbs: civitas,* in regard it is governed by juſtice and order of magiſtracy; *oppidum,* becauſe it contains a great number of inhabitants; and *urbs,* becauſe it is in due form ſurrounded with walls.

Kingdoms have been ſaid to contain as many cities as they have ſeats of archbiſhops and biſhops; but, according to Blount, *city* is a word that hath obtained ſince the conqueſt; for, in the time of the Saxons, there were no cities, but all the great towns were called *burghs,* and even London was then called *Londonburgh,* as the capital of Scotland is called *Edinburgh.* And long after the conqueſt the word *city* is uſed promiſcuouſly with the *burgh,* as in the charter of Leiceſter, where it is both called *civitas* and *burgus;* which ſhows that thoſe writers were miſtaken who tell us every city was, or is, a biſhop's ſee. And though the word *city* ſignifies with us ſuch a town corporate as hath uſually a biſhop and a cathedral church, yet it is not always ſo.

As to the ancient ſtate of cities and villages, whilſt the feudal policy prevailed, they held of ſome great lord on whom they depended for protection, and were ſubject to his arbitrary juriſdiction. The inhabitants were deprived of the natural and moſt unalienable rights of humanity. They could not diſpoſe of the effects which their own induſtry had acquired, either by a latter will or by any deed executed during their life. They had no right to appoint guardians for their children during their minority. They were not permitted to marry without purchaſing the conſent of the lord on whom they depended. If once they had commenced a law-ſuit, they durſt not terminate it by an accommodation, becauſe that would have deprived the lord, on whoſe court they pleaded, of the perquiſites due to him on paſſing his ſentence. Services of various kinds no leſs diſgraceful than oppreſſive were exacted from them without mercy or moderation. The ſpirit of induſtry was checked in ſome cities by abſurd regulations, and in others by unreaſonable exactions; nor would the narrow and oppreſſive maxims of a military ariſtocracy have permitted it ever to riſe to any degree of height or vigour.

Robertſon's Charles V.

The freedom of cities was firſt eſtabliſhed in Italy, owing principally to the introduction of commerce. As ſoon as they began to turn their attention towards this object, and to conceive ſome idea of the advantages they might derive from it, they became impatient to ſhake off the yoke of their inſolent lords, and to eſtabliſh among themſelves ſuch a free and equal government as would render property ſecure and induſtry flouriſhing. The German emperors, eſpecially thoſe of the Franconian and Suabian lines, as the ſeat of their government was far diſtant from Italy, poſſeſſed a feeble and imperfect juriſdiction in that country. Their perpetual quarrels, either with the popes or their own turbulent vaſſals, diverted their attention from the interior police of Italy, and gave conſtant employment for their arms. Theſe circumſtances induced ſome of the Italian cities towards the beginning of the 11th century, to aſſume new privileges; to unite together more cloſely, and to form themſelves into bodies politic, under the government of laws eſtabliſhed by common conſent. The rights which many cities acquired by bold or fortunate uſurpations, others purchaſed from the emperors, who deemed themſelves gainers when they received large ſums for immunities which they were no longer able to withhold; and ſome cities obtained

tained them gratuitouſly from the facility or generoſity of the pinces on whom they depended. The great increaſe of wealth which the cruſades brought into Italy, occaſioned a new kind of fermentation and activity in the minds of the people, and excited ſuch a general paſſion for liberty and independence, that, before the concluſion of the laſt cruſade, all the conſiderable cities in that country had either purchaſed or had extorted large immunities from the emperors.

This innovation was not long known in Italy before it made its way into France. Louis the Groſs, in order to create ſome power that might counterbalance thoſe potent vaſſals who controlled or gave law to the crown, firſt adopted the plan of conferring new privileges on the towns ſituated within his own domain. Theſe privileges were called *charters of community*, by which he enfranchiſed the inhabitants, aboliſhed all marks of ſervitude, and formed them into corporations or bodies politic, to be governed by a council and magiſtrates of their own nomination. Theſe magiſtrates had the right of adminiſtering juſtice within their own precincts; of levying taxes; of embodying and training to arms the militia of the town, which took the field when required by the ſovereign under the command of officers appointed by the community. The great barons imitated the example of their monarch, and granted like immunities to the towns within their territories. They had waſted ſuch great ſums in their expeditions to the Holy Land, that they were eager to lay hold on this new expedient for raiſing money by the ſale of thoſe charters of liberty. Though the conſtitution of communities was as repugnant to their maxims of policy as it was adverſe to their power, they diſregarded remote conſequences in order to obtain preſent relief. In leſs than two centuries, ſervitude was aboliſhed in moſt of the cities of France, and they became free corporations, inſtead of dependent villages without juriſdiction or privileges. Much about the ſame period the great cities of Germany began to acquire like immunities, and laid the foundations of their preſent liberty and independence. The practice ſpread quickly over Europe, and was adopted in Spain, England, Scotland, and all the other feudal kingdoms.

The Spaniſh hiſtorians are almoſt entirely ſilent concerning the origin and progreſs of communities in that kingdom; ſo that it is impoſſible to fix with any degree of certainty, the time and manner of their firſt introduction there. It appears, however, from Mariana, that in the year 1350 eighteen cities had obtained a ſeat in the Cortes of Caſtile. In Arragon, cities ſeem early to have acquired extenſive immunities, together with a ſhare in the legiſlature. In the year 1118, the citizens of Saragoſſa had not only obtained political liberty, but they were declared to be of equal rank with the nobles of the ſecond claſs; and many other immunities, unknown to perſons in their rank of life in other parts of Europe, were conferred upon them. In England, the eſtabliſhment of communities or corporations was poſterior to the conqueſt. The practice was borrowed from France, and the privileges granted by the crown were perfectly ſimilar to thoſe above enumerated. It is not improbable, that ſome of the towns in England were formed into corporations under the Saxon kings; and that the charters granted by the kings of the Norman race were not charters of enfranchiſements from a ſtate of ſlavery, but a confirmation of privileges which they had already enjoyed *. The Engliſh cities, however, were very inconſiderable in the 12th century. A clear proof of this occurs in the hiſtory juſt referred to. Fitz-Stephen, a contemporary author, gives a deſcription of the city of London in the reign of Henry II. and the terms in which he ſpeaks of its trade, its wealth, and the number of its inhabitants, would ſuggeſt no inadequate idea of its ſtate at preſent, when it is the greateſt and moſt opulent city in Europe. But all ideas of grandeur and magnificence are merely comparative. It appears from Peter of Blois, archdeacon of London, who flouriſhed in the ſame reign, and who had good opportunity of being informed, that this city, of which Fitz-Stephen gives ſuch a pompous account, contained no more than 40,000 inhabitants. The other cities were ſmall in proportion, and in no condition to extort any extenſive privileges. That the conſtitution of the boroughs of Scotland in many circumſtances reſemble that of the towns of France and England, is manifeſt from the *Leges Burgorum* annexed to the *Regiam Majeſtatem*.

CIVET, a kind of perfume which bears the name of the animal it is taken from, and to which it is peculiar. See VIVERRA.

Good civet is of a clear, yellowiſh, or browniſh colour; not fluid nor hard, but about the conſiſtence of butter or honey, and uniform throughout; of a very ſtrong ſmell, quite offenſive when undiluted, but agreeable when only a ſmall portion of civet is mixed with a large one of other ſubſtances. It unites eaſily with oils both expreſſed and diſtilled, but not at all with water or alcohol; nor can it be rendered miſcible with water by the mediation of ſugar. The yolk of an egg ſeems to diſpoſe it to unite with water; but in a very little while the civet ſeparates from the liquor, and falls to the bottom, though it does not prove of ſuch a reſinous tenacity as when treated with ſugar and alcohol. It communicates, however, ſome ſhare of its ſmell both to watery and ſpirituous liquors: hence a ſmall portion of it is often added in odoriferous tinctures, and ſuſpended in the ſtill-head during the diſtillation of odoriferous waters and ſpirits. It is rarely if ever employed for medicinal purpoſes. The Italians make it an ingredient in perfumed oils, and thus obtain the whole of its ſcent; for oils wholly diſſolve the ſubſtance of it. It is very rare, however, to meet with civet unadulterated. The ſubſtances uſually mixed with it are lard and butter, which agreeing with it in its general properties, render all criteria for diſtinguiſhing the adulteration impoſſible. A great trade of civet is carried on at Calicut, Baſſora, and other parts of the Indies, and in Africa, where the animal that produces the perfume is found. Live civet-cats are to be ſeen alſo in France and Holland. The French keep them only as a rarity; but the Dutch, who keep a great number, draw the civet from them for ſale. It is moſtly uſed by confectioners and perfumers.

Civet-Cat, the Engliſh name of the animal which produces the civet. See VIVERRA, MAMMALIA *Index*.

CIVIC CROWN, was a crown given by the ancient Romans to any ſoldier who had ſaved the life of a citizen in an engagement.

The civic crown was reckoned more honourable than any other crown, though compoſed of no better materials than oak boughs. Plutarch, in the life of C. M. Coriolanus, accounts as follows for uſing on this occaſion the branches of this tree before all others: becauſe, ſays he, the oaken wreath being ſacred to Jupiter, the great guardian of their city, they thought it the moſt proper ornament for him who had preſerved the life of a citizen. Pliny *, ſpeaking of the honour and privileges conferred on thoſe who had merited this crown, ſays, "They who had once obtained it, might wear it always." When they appeared at the public ſpectacles, the ſenate and people roſe to do them honour, and they took their ſeats on theſe occaſions among the ſenators. They were not only perſonally excuſed from all troubleſome offices, but procured the ſame immunity for their father and grandfather by the father's ſide.

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* See Lord Lyttelton's Hiſtory of Henry II. vol. ii. p. 317.

CIVIDAD de-las-Palmas, the capital town of the iſland of Canary, with a biſhop's ſee, and a good harbour. The houſes are well built, two ſtories high, and flat-roofed. The cathedral is a very handſome ſtructure; and the inhabitants are gay and rich. The air is temperate, and free from extremes of heat and cold. It is defended by a ſmall caſtle ſeated on a hill. W. Long. 14. 35. N. Lat. 28. 0.

Cividad Real, a town of Spain, in New Caſtile, and capital of La Mancha. The inhabitants are noted for dreſſing leather extremely well for gloves. W. Long. 4. 15. N. Lat. 39. 2.

Cividad Roderigo, a ſtrong and conſiderable town of Spain, in the kingdom of Leon, with a biſhop's ſee. It is ſeated in a fertile country, on the river Aquada, in W. Long. 6. 52. N. Lat. 40. 38.

Cividad-di-Friuli, a ſmall but ancient town of Italy, in Friuli, and in the territory of Venice; ſeated on the river Natiſona. E. Long. 13. 25. N. Lat. 46. 15.

CIVIL, in a general ſenſe, ſomething that regards the policy, public good, or peace, of the citizens or ſubjects of the ſtate; in which ſenſe we ſay, civil government, civil law, civil right, civil war, &c.

Civil, in a popular ſenſe, is applied to a complaiſant and humane behaviour in the ordinary intercourſe of life. See Civility.

Civil, in a legal ſenſe, is alſo applied to the ordinary procedure in an action, relating to ſome pecuniary matter or intereſt; in which ſenſe it is oppoſed to criminal.

Civil Death, any thing that cuts off a man from civil ſociety; as a condemnation to the galleys, perpetual baniſhment, condemnation to death, outlawry, and excommunication.

Civil Law, is properly the peculiar law of each ſtate, country, or city; but what we uſually mean by the civil law, is a body of laws compoſed out of the beſt Roman and Grecian laws, compiled from the laws of nature and nations; and, for the moſt part, received and obſerved throughout all the Roman dominions for above 1200 years. See Law *Index*.

It was firſt brought over into England by Theobald a Norman abbot, who was elected to the ſee of Canterbury in 1138; and he appointed a profeſſor, viz. Roger ſurnamed *Vicarius*, in the univerſity of Oxford, to teach it to the people of this country. Nevertheleſs, it gained ground very ſlowly. King Stephen iſſued a proclamation, prohibiting the ſtudy of it. And though the clergy were attached to it, the laity rather wiſhed to preſerve the old conſtitution. However, the zeal and influence of the clergy prevailed; and the civil law acquired great reputation from the reign of King Stephen to the reign of King Edward the III. both incluſive. Many tranſcripts of Juſtinian's Inſtitute are to be found in the writings of our ancient authors, particularly of Bracton and Fleta; and Judge Blackſtone obſerves, that the common law would have been loſt and overrun by the civil, had it not been for the incident of fixing the court of common pleas in one certain ſpot, and the forming the profeſſion of the municipal law into an aggregate body.

It is allowed, that the civil law contains all the principles of natural equity; and that nothing can be better calculated to form good ſenſe and ſound judgment. Hence, though in ſeveral countries it has no other authority but that of reaſon and juſtice, it is everywhere referred to for authority. It is not received at this day in any nation without ſome alterations; and ſometimes the feudal law is mixed with it, or general and particular cuſtoms; and often ordinances and ſtatutes cut off a great part of it.

In Turkey, the Baſilics are only uſed. In Italy, the canon law and cuſtoms have excluded a good part of it. In Venice, cuſtom hath almoſt an abſolute government. In the Milaneſe, the feudal law, and particular cuſtoms bear ſway. In Naples and Sicily, the conſtitutions and laws of the Lombards are ſaid to prevail. In Germany and Holland, the civil law is eſteemed to be the municipal law; but yet many parts of it are there grown obſolete; and others are altered, either by the canon law or a different uſage. In Friezeland, it is obſerved with more ſtrictneſs; but in the northern parts of Germany, the jus Saxonicum, Lubecenſe, or Culmenſe, is preferred before it. In Denmark and Sweden, it hath ſcarce any authority at all. In France, only a part of it is received, and that part is in ſome places as a cuſtomary law; and in thoſe provinces neareſt to Italy it is received as a municipal written law. In criminal cauſes, the civil law is more regarded in France; but the manner of trial is regulated by ordinances and edicts. In Spain and Portugal, the civil law is connected with the jus regium and cuſtom. In Scotland, the ſtatutes of the ſederunt, part of the regiæ majeſtatis, and their cuſtoms, controul the civil law.

In England, it is uſed in the eccleſiaſtical courts, in the high court of admiralty, in the court of chivalry, in the two univerſities, and in the courts of equity; yet in all theſe it is reſtrained and directed by the common law.

Civil Society. See Law *Index*.

Civil State, in the Britiſh polity, one of the general diviſions of the Laity, comprehending all orders of men from the higheſt noblemen to the meaneſt peaſant that are not included under the Military or Maritime ſtates; though it may ſometimes include individuals of theſe as well as of the Clergy; ſince a nobleman, a knight, a gentleman, or a peaſant, may become either a divine, a ſoldier, or a ſeaman. The diviſion of this ſtate is into Nobility and Commonalty. See theſe articles.

Civil War, a war between people of the ſame ſtate, or the citizens of the ſame city.

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* *Lib.* xvi. *cap.* 4.

Civil Year, is the legal year, or annual account of time, which every government appoints to be uſed within its own dominions; and is ſo called in contradiſtinction to the natural year, which is meaſured exactly by the revolution of the heavenly bodies.

CIVILIAN, in general, denotes ſomething belonging to the civil law; but more eſpecially the doctors and profeſſors therof are called *civilians*.

CIVILITY, a term uſed in common life as ſynonymous with complaiſance or good-breeding.

Civility is juſtly inculcated by didactic writers as a duty of no ſlight conſideration. Without civility, or good-breeding, a court would be the ſeat of violence and deſolation. There, all the paſſions are in fermentation; becauſe all purſue what but few can obtain; there, if enemies did not embrace, they would ſtab; there, ſmiles are often put on to conceal tears; there, mutual ſervices are profeſſed, while mutual injuries are intended; and there, the guile of the ſerpent ſimulates the gentleneſs of the dove. To what a degree muſt good-breeding adorn the beauty of truth, when it can thus ſoften the deformity of falſehood? On this ſubject we have the following elegant obſervations in Knox's Eſſays, N° 95.

"However juſt the complaints of the miſery of life, yet great occaſions for the diſplay of beneficence and liberality do not often occur. But there is an hourly neceſſity for the little kind offices of mutual civility. At the ſame time that they give pleaſure to others, they add to our own happineſs and improvement. Habitual acts of kindneſs have a powerful effect in ſoftening the heart. An intercourſe with poliſhed and humane company tends to improve the diſpoſition, becauſe it requires a conformity of manners. And it is certain, that a ſenſe of decorum, and of a proper external behaviour, will reſtrain thoſe whoſe natural temper would otherwiſe break out in acrimonious and petulant converſation. Even the affectation of philanthropy will in time contribute to realiſe it. The pleaſure reſulting from an act of kindneſs naturally excites a wiſh to repeat it; and indeed the general eſteem which the character of benevolence procures, is ſufficient to induce thoſe to wiſh for it who only act from the mean motives of ſelf-intereſt.

"As we are placed in a world where natural evil abounds, we ought to render it ſupportable to each other as far as human endeavours can avail. All that can add a ſweet ingredient to the bitter cup muſt be infuſed. Amid the multitude of thorns, every flower that will grow muſt be cultivated with care. But neither pomp nor power are of themſelves able to alleviate the load of life. The heart requires to be ſoothed by ſympathy. A thouſand little attentions from all around us are neceſſary to render our days agreeable. The appearance of neglect in any of thoſe with whom we are connected, chills our boſom with chagrin, or kindles the fire of reſentment. Nothing therefore ſeems ſo likely to enſure happineſs as our mutual endeavours to promote it. Our ſingle endeavours, originating and terminating in ourſelves, are uſually unſucceſsful. Providence has taken care to ſecure that intercourſe which is neceſſary to the exiſtence of ſociety, by rendering it the greateſt ſweetener of human life.

"By reciprocal attentions we are enabled to become beneficent without expence. A ſmile, an affable addreſs, a look of approbation, are often capable of giving a greater pleaſure than pecuniary benefits can beſtow. The mere participation of the ſtudies and amuſements of others, at the ſame time that it gratifies ourſelves, is often an act of real humanity; becauſe others would not enjoy them without companions. A friendly viſit in a ſolitary hour, is often a greater act of kindneſs than a valuable preſent.

"It is really matter of ſurpriſe, that thoſe who are diſtinguiſhed by rank and opulence ſhould ever be unpopular in their neighbourhood. They muſt know the value of popularity; and ſurely nothing is more eaſily obtained by a ſuperior. Their notice confers honour, and the aſpiring heart of man is always delighted with diſtinction. A gracious look from them diffuſes happineſs on the lower ranks. But it uſually happens, that an overgrown rich man is not the favourite of a neighbouring country; and it is unfortunate, that pride or inadvertence often prevent men from acting the godlike part of making others happy, even when they might do it without inconvenience to themſelves."

CIVITA-DI-PENNA, an ancient town of Italy, in the kingdom of Naples, and in the Farther Abruzzo, with a biſhop's ſee. It is ſituated near the river Salino, 25 miles north-eaſt of Aquila. E. Long. 13. 3. N. Lat. 42. 25.

Civita Caſtellana, a town of Italy, in St Peter's patrimony, ſeated on a river, which, ſeven miles from thence, falls into the Tiber. E. Long. 13. 5. N. Lat. 42. 15.

Civita Turchino, a place in Italy, about two miles north of the town of Corneto in the patrimony of St Peter. It is a hill of an oblong form, the ſummit of which is almoſt one continued plain. From the quantity of medals, intaglios, fragments of inſcriptions, &c. that are occaſionally found here, this is believed to be the very ſpot where the ancient and powerful city of Tarquinii once ſtood. At preſent it is only one continued field of corn. On the ſouth-eaſt ſide of it runs the ridge of a hill which unites it to Corneto. This ridge is at leaſt three or four miles in length, and almoſt entirely covered with artificial hillocks, called by the inhabitants *monti-roſſi*. About twelve of theſe hillocks have at different times been opened; and in every one of them have been found ſeveral ſubterranean apartments cut out of the ſolid rock. Theſe apartments are of various forms and dimenſions; ſome conſiſt of a large outer room, and a ſmall one within; others of a ſmall room, at the firſt entrance, and a large one within; others are ſupported by a column of the ſolid rock left in the centre, with openings on every part. The entrance to them all is by a door about five feet high, by two and a half broad. Some of them have no light but from the door, while others ſeem to have had a ſmall light from above, through a hole of a pyramidal form. Many of theſe apartments have an elevated port that runs all round the wall, being a part of the rock left for that purpoſe. The moveables found in theſe apartments conſiſt chiefly of Etruſcan vaſes of various forms. in ſome indeed have been found ſome plain ſarcophagi of ſtone, with bones in them. The whole of theſe apartments are ſtuccoed, and ornamented in various manners: ſome indeed are plain; but others, particularly three, are richly adorned, having a double row of Etruſcan inſcriptions running round the upper part of the walls, and under them a kind of frieze of figures in painting; ſome have an ornament under the figures, which ſeems to ſupply the place of an architrave. The paintings ſeem to be in freſco; and in general reſemble thoſe which are uſually ſeen upon Etruſcan vaſes; though ſome of them are perhaps ſuperior to any thing as yet ſeen of the Etruſcan art in painting. In general they are ſlight, but well conceived; and prove, that the artiſt was capable of producing things more ſtudied and better finiſhed; though, in ſuch a ſubterraneous ſituation, the delicacy of a finiſhed work would in a great meaſure have been thrown away. It is probable, however, that among the immenſe number of theſe apartments that yet remain to be opened, many paintings and inſcriptions may be found ſufficient to form a very uſeful and entertaining work. At preſent this great ſcene of antiquities is almoſt entirely unknown, even in Rome. Mr Jenkins, reſident at Rome, was the firſt Engliſhman who viſited it.

Civita-Vecchia, a ſea-port town of Italy in the patrimony of St Peter, with a good harbour and an arſenal. Here the Pope's galleys are ſtationed, and it has lately been made a free port; but the air is very unwholeſome. E. Long. 12. 31. N. Lat. 45. 5.

CIVOLI, or Cigoli, *Lewis*, an Italian painter, whoſe family name was *Cardi*, was born at the caſtle of Cigoli, in Tuſcany, in the year 1559. His *ecce homo*, which he performed as a trial of ſkill with Barochio and Michael Angelo de Caravaggio, was judged better than thoſe executed by them. He excelled in deſigning, and was employed by the popes and princes of his time. He died at Rome in 1613.

CIUS, in *Ancient Geography*, a town and river of Bithynia, which gave name to the Sinus Cianus. The town was afterwards called *Pruſſia*, Cius having been deſtroyed by Philip father of Perſeus, and rebuilt by Pruſias king of Bithynia. In the river, Hylas, the favourite boy of Hercules, was drowned; (Apollonius Rhodius).

CLAC, among countrymen. To clack wool, is to cut off the ſheep's mark, which makes the weight leſs, and yields leſs cuſtom to the king.

CLACKMANNAN, the name of a ſmall ſhire in Scotland, not exceeding eight miles in length and five in breadth. It is bounded on the ſouth by the frith of Forth; on the north and weſt by Perthſhire; and on the eaſt by Fife. The country is plain and fertile towards the frith, producing corn and paſture in abundance. It likewiſe yields great quantities of excellent coal, which is exported to England, France, and Holland. It is watered by the rivers Forth and Devan, and joins the ſhire of Kinroſs in ſending a member alternately to parliament.

Population of the different Pariſhes in this County at two Periods.

	In 1755.	In 1790—1798.
Alloa, - -	5816	4802
Clackmannan, -	1913	2528
Dollar, - -	517	510
Tillicoultry, -	757	909
	9003	8749
	8749*	
Decreaſe, -	254	

* Statiſt. Hiſt.

Clackmannan, a ſmall town of Scotland, and capital of the county of that name, is ſituated on the northern ſhore of the Forth, in W. Long. 3. 40. N. Lat. 56. 15. It ſtands on a hill, on the top of which is the caſtle, commanding a noble proſpect. It was long the ſeat of the chief of the Bruces, who was hereditary ſheriff of the county before the juriſdictions were aboliſhed. The large ſquare tower is called after the name of *Robert Bruce*, whoſe great ſword and caſque are ſtill preſerved here. The hill is prettily wooded; and, with the tower, forms a pictureſque object. Clackmannan is ſtill the ſeat of the Bruces of Kennet.

CLAGENFURT, a ſtrong town of Germany, and capital of Carinthia, ſituated in E. Long. 13. 56. N. Lat. 46. 50.

CLAGET, William, an eminent and learned divine, born in 1646. He was preacher to the ſociety of Gray's Inn, which employment he exerciſed until he died in 1688, being then alſo one of the king's chaplains. Archbiſhop Sharp gives him an excellent character; and Biſhop Burnet has ranked him among thoſe worthy men whoſe lives and labours contributed to reſcue the church from the reproaches which the follies of others had drawn upon it. Dr Claget publiſhed ſeveral things; but his principal work is his "Diſcourſe concerning the Operations of the Holy Spirit:" nor muſt it be forgotten that he was one of thoſe excellent divines who made a noble ſtand againſt the deſigns of James II. to introduce popery. Four volumes of his ſermons were publiſhed after his death by his brother Nicholas Claget, archdeacon of Sudbury, father of Nicholas Claget afterwards biſhop of Exeter.

CLAIM, in *Law*, a challenge of intereſt in any thing that is in the poſſeſſion of another.

CLAIR, obſcure. See *Claro-Obſcuro*.

CLAIRAULT, Alexis, of the French academy of ſciences, was one of the moſt illuſtrious mathematicians in Europe. He read to the academy in 1726, when he was not 13 years old, "A Memoir upon Four new Geometrical Curves of his own invention;" and ſupported the character he thus laid a foundation for by various publications from time to time. He publiſhed *Elémens de Géometrie*, 1741, in 8vo; *Elémens d'Algebre*, 1746, in 8vo; *Théorie de la Figure de la Terre*, 1743, in 8vo; *Tables de la Lune*, 1754, in 8vo. He was concerned alſo in the *Journal de Sçavans*, which he furniſhed with many excellent extracts. He died in 1765. He was one of the academicians who were ſent into the north to determine the figure of the earth.

CLAM, in *Zoology*, a ſhell-fiſh. See Venus.

CLAMP, a piece of wood joined another.

Clamp is likewiſe the term for a pile of unburnt bricks built up for burning. Theſe clamps are built much after the ſame manner as arches are built in kilns, viz. with a vacuity betwixt each brick's breath for the fire to aſcend by; but with this difference, that inſtead of arching, they truſs over, or over-ſpan; that is, the end of one brick is laid about half way over the end of another, and ſo till both ſides meet within half a brick's length, and then a binding brick at the top finiſhes the arch.

Clamp in a ſhip, denotes a piece of timber applied to a maſt or yard to prevent the wood from burſting; and alſo a thick plank lying fore and aft under the beams of the firſt orlop, or ſecond deck, and is the ſame that the riſing timbers are to the deck.

Clamp-Nails, ſuch nails as are uſed to faſten on clamps in the building or repairing of ſhips.

CLAMPETIA, in *Ancient Geography*, a town of the Brutii, one of thoſe which revolted from Hannibal (Livy); called *Lampetia* by Polybius. Now *Amantia*, or *Mantia*, a town of Calabria Ultra, near the bay of Euphemia. E. Long. 16. 20. N. Lat. 39. 15.

CLAMPING, in joinery, is the fitting a piece of board with the grain to another piece of board croſs the grain. Thus the ends of tables are commonly clamped, to prevent their warping.

CLANDESTINE, any thing done without the knowledge of the parties concerned, or without the proper ſolemnities. Thus a marriage is ſaid to be clandeſtine, when performed without the publication of bans, the conſent of parents, &c.

CLANS, in hiſtory, and particularly in that of Scotland. The nations which overran Europe were originally divided into many ſmall tribes; and when they came to parcel out the lands which they had conquered, it was natural for every chieftain to beſtow a portion, in the firſt place, upon thoſe of his own tribe or family. Theſe all held their lands of him; and as the ſafety of each individual depended on the general union, theſe ſmall ſocieties clung together, and were diſtinguiſhed by ſome common appellation, either patronymical or local, long before the introduction of ſurnames or enſigns armorial. But when theſe became common, the deſcendants and relations of every chieftain aſſumed the ſame name and arms with him; other vaſſals were proud to imitate their example; and by degrees they were communicated to all thoſe who held of the ſame ſuperior. Thus clanſhips were formed; and in a generation or two, that conſanguinity, which was at firſt in a great meaſure imaginary, was believed to be real. An artificial union was converted into a natural one: men willingly followed a leader, whom they regarded both as the ſuperior of their lands and the chief of their blood; and ſerved him not only with the fidelity of vaſſals, but the affection of friends. In the other feudal kingdoms, we may obſerve ſuch unions as we have deſcribed, imperfectly formed; but in Scotland, whether they were the production of chance, or the effect of policy, or ſtrengthened by their preſerving their genealogies both genuine and fabulous, clanſhips were univerſal. Such a confederacy might be overcome; it could not be broken; and no change of manner or government has been able, in ſome parts of the kingdom, to diſſolve aſſociations which are founded upon prejudices ſo natural to the human mind. How formidable were nobles at the head of followers, who, counting that cauſe juſt and honourable which their chief approved, were ever ready to take the field at his command, and to ſacrifice their lives in defence of his perſon or of his fame! Againſt ſuch men a king contended with great diſadvantage; and that cold ſervice, which money purchaſes, or authority extorts, was not an equal match for their ardour and zeal.

obertſon's iſtory of cotland.

Some imagine the word *clan* to be only a corruption of the Roman *colonia*; but Mr Whittaker aſſerts it to be purely Britiſh, and to ſignify a *family*.

CLAP, in *Medicine*, the firſt ſtage of the venereal diſeaſe, more uſually called a Gonorrhoea.

Clap-Net, in birding, a ſort of net contrived for the taking of larks with the looking-glaſs, by the method called *daring* or *doring*. The nets are ſpread over an even piece of ground, and the larks are invited to the place by other larks faſtened down, and by a looking glaſs compoſed of five pieces, and fixed in a frame ſo that it is turned round very ſwiftly backwards and forwards, by means of a cord pulled by a perſon at a conſiderable diſtance behind a hedge. See Doring.

CLAR, or Claer, in *Metallurgy*, bone-aſhes perfectly calcined, and finely powdered, kept purpoſely for covering the inſides of Coppels.

CLARAMONT-powder, a kind of earth, called *terra de Baira*, from the place where it is found; it is famous at Venice, for its efficacy in ſtopping hemorrhagies of all kinds, and in curing malignant fevers.

Precept *of* CLARE constat, in *Scots Law*, the warrant of a ſuperior for entering and infefting the heir of his former vaſſal, without the interpoſition of an inqueſt.

Nuns of St Clare, were founded at Aſſiſa in Italy, about the year 1212. Theſe nuns obſerved the rule of St Francis, and wore habits of the ſame colour with thoſe of the Franciſcan friars; and hence were called *Menoreſſes*; and their houſe, without Aldgate, the Minories, where they were ſettled when firſt brought over into England, about the year 1293. They had only three houſes beſides this.

Clare, a market-town of Suffolk, 13 miles ſouth of Bury. E. Long. 0. 35. N. Lat. 52. 15. It gives the title of earl to the duke of Newcaſtle.

Clare is alſo the capital of a county of the ſame name in the province of Connaught, in Ireland, ſituated about 17 miles north-weſt of Limerick. W. Long. 9. 0. N. Lat. 52. 40.

CLARENCIEUX, the ſecond king at arms, ſo called from the duke of Clarence, to whom he firſt belonged; for Lionel, 3d ſon to Edward III. having by his wife the honour of Clare in the county of Thomond, was afterwards declared duke of Clarence; which dukedom afterwards eſcheating to Edward IV. he made this earl a king at arms. His office is to marſhal and diſpoſe of the funerals of all the lower nobility, as baronets, knights, eſquires, on the ſouth ſide of the Trent; whence he is ſometimes called *ſurroy* or *ſouth roy*, in contradiſtinction to *norroy*.

CLARENDON, *Conſtitutions of*, certain conſtitutions made in the reign of Henry II. A. D. 1164, in a parliament held at Clarendon, whereby the king checked the power of the pope and his clergy, and greatly narrowed the total exemption they claimed from ſecular juriſdiction.

CLARENDON, *Earl of.* See HYDE.

CLARENNA, Tabulae, in *Ancient Geography*, a town of Vindelicia, at the confluence of the Lycus and Danube. Now *Rain*, a town of Bavaria, on the ſouth ſide of the Danube, at the confluence of the Lech. E. Long. 11. 0. N. Lat. 48. 45.

CLARENZA, the capital of a duchy of the ſame name in the Morea; it is a ſea-port town, ſituated on the Mediterranean. E. Long 21. 40. N. Lat. 37. 40.

CLARET, a name given by the French to ſuch of their red wines as are not of a deep or high colour. See WINE.

CLARICHORD, or MANICHORD, a muſical inſtrument in form of a ſpinet.

It has 49 or 50 ſtops, and 70 ſtrings, which bear on five bridges; the firſt whereof is the higheſt, the reſt diminiſhing in proportion. Some of the ſtrings are in uniſon, their number being greater than that of the ſtops. There are ſeveral little mortoiſes for paſſing the jacks, armed with braſs-hooks, which ſtop and raiſe the chords inſtead of the feather uſed in virginals and ſpinets; but what diſtinguiſhes it moſt is, that the chords are covered with pieces of cloth, which render the ſound ſweeter, and deaden it ſo that it cannot be heard at any conſiderable diſtance; whence it comes to be particularly in uſe among the nuns, who learn to play, and are unwilling to diſturb the ſilence of the dormitory.

CLARIFICATION, the act of cleaning or fining any fluid from all heterogeneous matter or feculencies.

The ſubſtances uſually employed for clarifying liquors, are whites of eggs, blood, and iſinglaſs. The two firſt are uſed for ſuch liquors as are clarified whilſt boiling hot; the laſt for thoſe which are clarified in the cold, ſuch as wines, &c. The whites of eggs are beaten up into a froth, and mixed with the liquor, upon which they unite with and entangle the impure matters that float in it; and preſently growing hard by the heat, carry them up to the ſurface in form of a ſcum, no longer diſſoluble in the liquid. Blood operates in the ſame manner, and is chiefly uſed in purifying the brine from which ſalt is made. Great quantities of iſinglaſs are conſumed for fining turbid wines. For this purpoſe ſome throw an entire piece, about a quarter of an ounce, into a wine caſk; by degrees the glue diſſolves, and forms a ſkin upon the ſurface, which at length ſubſiding, carries down with it the feculent matter which floated in the wine. Others previouſly diſſolve the iſinglaſs; and having boiled it down to a ſlimy conſiſtence, mix it with the liquor, roll the caſk ſtrongly about, and then ſuffer it to ſtand to ſettle. Neumann queſtions the wholeſomeneſs of wines thus purified, and aſſures us that he himſelf, after drinking only a few ounces of ſack thus clarified, but not ſettled quite fine, was ſeized with ſickneſs and vomiting, followed by ſuch a vertigo, that he could not ſtand upright for a minute together. The giddineſs continued with a nauſea and want of appetite for ſeveral days.

CLARIGATIO, in Roman antiquity, a ceremony that always preceded a formal declaration of war. It was performed in this manner: firſt four heralds crowned with vervain were ſent to demand ſatisfaction for the injuries done the Roman ſtate. Theſe heralds taking the gods to witneſs that their demands were juſt, one of them, with a clear voice, demanded reſtitution within a limited time, commonly 33 days, which being expired without reſtitution made, then the *pater patratus*, or prince of the heralds, proceeded to the enemies frontiers, and declared war.

CLARII APOLLINIS FANUM (Strabo, Pliny), a temple and grove of Apollo, ſituated between Colophon and Lebedos, in Ionia: called *Claros* (Thucydides, Ovid). The name alſo of a town and mountain there (Nicander); and of a fountain (Clemens Alexandrinus); the waters of which inſpired with prophetic fury. *Clarius* the epithet of Apollo (Strabo).

CLARION, a kind of trumpet, whoſe tube is narrower and its tone acuter and ſhriller than that of the common trumpet. It is ſaid that the clarion, now uſed among the Moors and Portugueſe, who borrowed it from the Moors, ſerved anciently for a treble to ſeveral trumpets, which ſounded tenor and baſs.

CLARISSES, an order of nuns ſo called from their founder St Clara or St Clare. (See St CLARE). She was in the town of Aſſiſa in Italy; and having renounced the world to dedicate herſelf to religion, gave birth to this order in the year 1212; which comprehends not only thoſe nuns that follow the rule of St Francis, according to the ſtrict letter, and without any mitigation, but thoſe likewiſe who follow the ſame rule ſoftened and mitigated by ſeveral popes. It is at preſent one of the moſt flouriſhing orders of nuns in Europe. After Ferdinand Cortez had conquered Mexico for the king of Spain, Iſabella of Portugal, wife of the emperor Charles V. ſent thither ſome nuns of the order of St Clara, who made ſeveral ſettlements there. Near their monaſteries were founded communities of Indian young women, to be inſtructed by the clariſſes in religion, and ſuch works as were ſuitable to perſons of their ſex. Theſe communities are ſo conſiderable that they uſually conſiſt of four or five hundred.

CLARKE, DR SAMUEL, a preacher and writer of conſiderable note in the reign of Charles II. was, during the interregnum, and at the time of the ejection, miniſter of St Bennet Fink in London. In November 1660, he, in the name of the Preſbyterian miniſters, preſented an addreſs of thanks to the king for his declaration of liberty of conſcience. He was one of the commiſſioners of the Savoy, and behaved on that occaſion with great prudence and moderation. He ſometimes attended the church as a hearer and communicant, and was much eſteemed by all that knew him, for his great probity and induſtry. The moſt valuable of his numerous works are ſaid to be his Lives of the Puritan Divines and other perſons of note, 22 of which are printed in his Martyrology; the reſt are in his Lives of ſundry eminent Perſons in this latter Age, folio; and his Marrow of Eccleſiaſtical Hiſtory, in folio and quarto. He died in 1680.

CLARKE, *Samuel*, the ſon of the former, was fellow of Pembroke-hall in Cambridge; but was ejected from his fellowſhip for refuſing to take the engagements, as he was alſo afterwards from his rectory of Grendon in Buckinghamſhire. He applied himſelf early to the ſtudy of the Scriptures, and his Annotations on the Bible, printed together with the ſacred text, is highly commended by Dr Owen, Mr Baxter, and Dr Calamy. He died in 1701, aged 75.

Clarke, *Dr Samuel*, a very celebrated Engliſh divine, was the ſon of Edward Clarke, Eſq. alderman of Norwich, and one of its repreſentatives in parliament for ſeveral years; and born there October 11. 1675. He was inſtructed in claſſical learning at the free-ſchool of that town; and in 1691 removed thence to Caius College in Cambridge, where his uncommon abilities ſoon began to diſplay themſelves. Though the philoſophy of Des Cartes was at that time the eſtabliſhed philoſophy of the univerſity, yet Clarke eaſily maſtered the new ſyſtem of Newton; and in order to his firſt degree of arts, performed a public exerciſe in the ſchools upon a queſtion taken from it. He greatly contributed to the eſtabliſhment of the Newtonian philoſophy by an excellent tranſlation of, and notes upon, Rohault's "Phyſics," which he finiſhed before he was 22 years of age. The ſyſtem of natural philoſophy then generally taught in the univerſity was that written by Rohault, founded altogether upon Carteſian principles, and very ill tranſlated into Latin. Clarke gave a new tranſlation, and added to it ſuch notes as might lead ſtudents inſenſibly and by degrees to other and truer notions than could be found there. "And this certainly (ſays Biſhop Hoadly) was a more prudent method of introducing truth unknown before, than to attempt to throw aſide this treatiſe entirely, and write a new one inſtead of it. The ſucceſs anſwered exceedingly well to his hopes; and he may juſtly be ſtyled a great benefactor to the univerſity in this attempt. For by this means the true philoſophy has, without any noiſe, prevailed; and to this day his tranſlation of Rohault is, generally ſpeaking, the ſtanding text for lectures, and his notes the firſt direction to thoſe who are willing to receive the reality and truth of things in the place of invention and romance." Whiſton relates, that in 1697, while he was chaplain to Moore biſhop of Norwich, he met young Clarke, then wholly unknown to him, at a coffeehouſe in that city; where they entered into a converſation about the Carteſian philoſophy, particularly Rohault's "Phyſics," which Clarke's tutor, as he tells us, had put him upon tranſlating. "The reſult of this converſation was (ſays Whiſton), that I was greatly ſurpriſed that ſo a young a man as Clarke then was ſhould know ſo much of thoſe ſublime diſcoveries, which were then almoſt a ſecret to all but to a few particular mathematicians Nor did I remember (continues he) above one or two at the moſt, whom I had then met with, that ſeemed to know ſo much of that philoſophy as Clarke." This tranſlation of Rohault was firſt printed in 1697, 8vo. There have been four editions of it, in every one of which improvements have been made; eſpecially in the laſt in 1718, which has the following title: *Jacobi Rohaulti Phyſica. Latine vertit, recenſuit, et uberioribus jam Annotationibus, ex illuſtriſſimi Iſaaci Newtoni Philoſophia maximam partem hauſtis, amplificavit et ornavit S. Clarke, S. T. P. Accedunt etiam in hac quarta editione novæ aliquot tabulæ æri inciſæ, et Annotationes multum ſunt auctæ.* Dr John Clarke, late dean of Sarum, and our author's brother, tranſlated this work into Engliſh, and publiſhed it in 2 vols 8vo.

Afterwards he turned his thoughts to divinity; and in order to fit himſelf for the ſacred function, he ſtudied the Old Teſtament in the original Hebrew, the New in the original Greek, and the primitive Chriſtian writers. Having taken holy orders, he became chaplain to Moore biſhop of Norwich, who was ever after his conſtant friend and patron. In 1699 he publiſhed two treatiſes: one entitled "Three practical Eſſays on Baptiſm, Confirmation, and Repentance;" the other, "Some Reflections on that part of a book called Amyntor, or a Defence of Milton's Life, which relates to the Writings of the Primitive Fathers, and the Canon of the New Teſtament." In 1701 he publiſhed "A Paraphraſe upon the Goſpel of St Matthew;" which was followed in 1702 by the "Paraphraſes upon the Goſpels of St Mark and St Luke," and ſoon after by a third volume "upon St John." They were afterwards printed together in 2 vols 8vo; and have ſince undergone ſeveral editions. He intended to have gone through the remaining books of the New Teſtament, but ſomething accidentally interrupted the execution.

Meanwhile Biſhop Moore gave him the rectory of Drayton near Norwich, and procured for him a pariſh in that city; and theſe he ſerved himſelf in that ſeaſon when the biſhop reſided at Norwich. In 1704 he was appointed to preach Boyle's lecture; and the ſubject he choſe was, "The being and attributes of God." He ſucceeded ſo well in this, and gave ſuch high ſatisfaction, that he was appointed to preach the ſame lecture the next year; when he choſe for his ſubject "The evidences of natural and revealed religion." Theſe ſermons were firſt printed in two diſtinct volumes; the former in 1705, the latter in 1706. They have ſince been printed in one volume, under the general title of "A Diſcourſe concerning the Being and Attributes of God, the Obligations of natural Religion, and the Truth and Certainty of the Chriſtian Revelation, in anſwer to Hobbes, Spinoza, the Author of the Oracles of Reaſon, and other Deniers of natural and revealed Religion." Clarke having endeavoured in the firſt part of this work to ſhow, that the being of a God may be demonſtrated by arguments *à priori*, is unluckily involved in the cenſure which Pope has paſſed upon this method of reaſoning in the following lines. They are put into the mouth of one of his dunces, addreſſing himſelf to the goddeſs Dulneſs:

> "Let others creep by timid ſteps and ſlow,
> "On plain experience lay foundations low,
> "By common ſenſe to common knowledge bred,
> "And loſt to nature's cauſe through nature led.
> "All-ſeeing in thy miſts, we want no guide,
> "Mother of arrogance, and ſource of pride!
> "We nobly take the high priori road,
> "And reaſon downward, till we doubt of God."
> *Dunciad*, b. 4. l. 455.

Upon which we have the following note: "Thoſe who, from the effects in this viſible world, deduce the eternal power and godhead of the Firſt Cauſe, though they cannot attain to an adequate idea of the Deity, yet diſcover ſo much of him as enables them to ſee the end of their creation and the means of their happineſs: whereas they who take this high priori road, as Hobbes, Spinoza, Des Cartes, and ſome better reaſoners,

ſoners, for one that goes right, ten loſe themſelves in miſt, or ramble after viſions, which deprive them of all ſight of their end, and miſlead them in the choice of wrong means." Clarke, it is probable, would not have denied this; and the poet perhaps would have ſpared his better reaſoners, and not have joined them with ſuch company, had he recollected our author's apology for uſing the argument *à priori.* "The argument *à poſteriori* (ſays he) is indeed by far the moſt generally uſeful argument, moſt eaſy to be underſtood, and in ſome degree ſuited to all capacities; and therefore it ought always to be inſiſted upon: But for as much as atheiſtical writers have ſometimes oppoſed the being and attributes of God by ſuch metaphyſical reaſonings, as can no otherwiſe be obviated than by arguing *à priori;* therefore this manner of arguing alſo is uſeful and neceſſary in its proper place." To this may be added the anſwer he made to Mr Whiſton upon this occaſion, as narrated by the latter in his Hiſtorical Memoirs. "When Clarke brought me his book, I was in my garden againſt St Peter's college in Cambridge, where I then lived. Now I perceived that in theſe ſermons he had dealt a great deal in abſtract and metaphyſical reaſoning. I therefore aſked him how he ventured into ſuch ſubtleties which I never durſt meddle with? and ſhowing him a nettle, or ſome contemptible weed in my garden, I told him that weed contained better arguments for the being and attributes of God than all his metaphyſics. Clarke confeſſed it to be ſo; but alleged for himſelf, that ſince ſuch philoſophers as Hobbes and Spinoza had made uſe of thoſe kind of ſubleties againſt, he thought proper to ſhow that the like way of reaſoning might be made better uſe of on the ſide of, religion; which reaſon or excuſe I allowed to be not inconſiderable." Undoubtedly, as the preſent editor of the Biographia Britannica obſerves, the grand, the proper, the deciſive proof of the exiſtence, perfections, and providence of the Deity, muſt be drawn from his works. On this proof, as being equally ſatisfactory to the profoundeſt philoſopher and the meaneſt peaſant, the cauſe of religion will ever ſtand ſecure. Nevertheleſs, if there be ſuch a thing as an argument *à priori*, why may not ſpeculative men be employed in its examination? Several able divines and philoſophers have thought, and ſtill think, that this argument for the being and attributes of God will ſtand the teſt of the ſevereſt ſcrutiny; and therefore they cannot be blamed for endeavouring to ſet it in a convincing light to others. As to the merit, indeed, of the whole work under conſideration, including the evidences of natural and revealed religion, it is undoubtedly of the firſt order. Difficulties may be raiſed on particular points, and the ableſt and moſt candid inquirers may ſometimes ſee cauſe to heſitate with regard to the validity of the reaſoning; but ſtill, in general, the book reflects honour on the age as well as the author that produced it, and will deſcend, with diſtinguiſhed reputation, to a late poſterity. The defence, in particular, of the ſacred original and authority of Chriſtianity is admirably conducted.

In 1706 he publiſhed "A Letter to Mr Dodwell;" wherein all the arguments in his epiſtolary diſcourſe againſt the immortality of the ſoul are particularly anſwered, and the judgment of the fathers, to whom Mr Dodwell had appealed concerning that matter, truly repreſented. Biſhop Hoadly obſerves, that in this letter he anſwered Mr Dodwell in ſo excellent a manner, both with regard to the philoſophical part, and to the opinions of ſome of the primitive writers, upon whom theſe doctrines were fixed, that it gave univerſal ſatisfaction. But this controverſy did not ſtop here; for the celebrated Collins, coming in as a ſecond to Dodwell, went much farther into the philoſophy of the diſpute, and indeed ſeemed to produce all that could poſſibly be ſaid againſt the immateriality of the ſoul, as well as the liberty of human actions. This enlarged the ſcene of the diſpute, into which our author entered, and wrote with ſuch a ſpirit of clearneſs and demonſtration, as at once ſhowed him greatly ſuperior to his adverſaries in metaphyſical and phyſical knowledge, and made every intelligent reader rejoice, that ſuch an incident had happened to provoke and extort from him that plenty of ſtrong reaſoning and perſpicuity of expreſſion, which were indeed very much wanted upon this intricate and obſcure ſubject. "And I am perſuaded (continues the biſhop), that as what he has written in this controverſy comprehends the little that the ancients had ſaid well, and adds ſtill more evidence than ever appeared clearly before, and all in words that have a meaning to them, it will remain the ſtandard of good ſenſe on that ſide of the queſtion, on which he ſpent ſo many of his thoughts, as upon one of his favourite points." Clarke's letter to Dodwell was ſoon followed by four defences of it, in four ſeveral letters to the author of "A letter to the learned Mr Henry Dodwell, containing ſome Remarks on a pretended Demonſtration of the Immateriality and natural Immortality of the Soul, in Mr Clarke's Anſwer to his late Epiſtolary Diſcourſe, &c." They were afterwards all printed together; and the "Anſwer to Toland's Amyntor" added to them. In the midſt of all theſe labours, he found time to ſhow his regard to mathematical and phyſical ſtudies, and exact knowledge and ſkill in them. And his natural affection and capacity for theſe ſtudies were not a little improved by the friendſhip of Sir Iſaac Newton, at whoſe requeſt he tranſlated his "Optics" into Latin in 1706. With this verſion Sir Iſaac was ſo highly pleaſed, that he preſented him with the ſum of 500l. or 100l. for each child, Clarke having then five children.

This year alſo, Biſhop Moore, who had long formed a deſign of fixing him more conſpicuouſly, procured for him the rectory of St Bennet's, Paul's Wharf, in London; and ſoon after carried him to court, and recommended him to the favour of Queen Anne. She appointed him one of her chaplains in ordinary; and, in conſideration of his great merit, and at the requeſt of the biſhop, preſented him to the rectory of St James's, Weſtminſter, when it became vacant in 1709. Upon his advancement to this ſtation, he took the degree of D. D. when the public exerciſe which he performed for it at Cambridge was prodigiouſly admired. The queſtions which he maintained were theſe: 1. "Nullum fidei Chriſtianæ dogma, in ſacris ſcripturis traditum, eſt rectæ rationi diſſentaneum;" that is, "No article of the Chriſtian faith, delivered in the Holy Scriptures, is diſagreeable to right reaſon." 2. "Sine actionum humanarum libertate nulla poteſt eſſe religio;" that is, "Without the liberty of human actions there can be no religion." His theſis was upon the firſt of theſe queſtions, which being thoroughly ſifted by that moſt acute diſputant Profeſſor James, he made an extempore reply, in a continued diſcourſe for near half an hour, with ſo little heſitation, that many of the auditors declared themſelves aſtoniſhed; and owned, that if they had not been within ſight of him, they ſhould have ſuppoſed him to have read every word of it from a paper. After this, through the courſe of the ſyllogiſtical diſputation, he guarded ſo well againſt the arts which the profeſſor was a complete maſter of; replied ſo readily to the greateſt difficulties ſuch an objector could propoſe; and preſſed him ſo cloſe and hard with clear and intelligible anſwers, that perhaps there never was ſuch a conflict heard in thoſe ſchools. The profeſſor, who was a man of humour as well as learning, ſaid to him at the end of the diſputation, "Profecto, me probe exercuiſti;" that is, "On my word, you have worked me ſufficiently;" and the members of the univerſity went away, admiring, as indeed they well might, that a man even of Clarke's abilities, after an abſence of ſo many years, and a long courſe of buſineſs of quite another nature, ſhould acquit himſelf in ſuch a manner, as if this ſort of academical exerciſe had been his conſtant employment; and with ſuch fluency and purity of expreſſion, as if he had been accuſtomed to no other language in converſation but Latin. The ſame year, 1709, he reviſed and corrected Whiſton's tranſlation of the "Apoſtolical Conſtitutions" into Engliſh. Whiſton tells us, that his own ſtudies having been chiefly upon other things, and having rendered him incapable of being alſo a critic in words and languages, he deſired his great friend and great critic Dr Clarke to reviſe that tranſlation; which he was ſo kind as to agree to.

In 1712, he publiſhed a moſt beautiful and pompous edition of Cæſar's commentaries, adorned with elegant ſculptures. It is entitled, "C. Julii Cæſaris quæ extant, accuratiſſimè cum libris editis et miſſ. optimis collata, recognita, et correcta; acceſſerunt annotationes Samuelis Clarke, S. T. P. item indices locorum, rerumque et verborum, utiliſſimæ." It was printed in 1712, folio; and afterwards, in 1720, 8vo. It was dedicated to the great duke of Marlborough, "at a time," ſays Biſhop Hoadly, "when his unequalled victories and ſucceſſes had raiſed his glory to the higheſt pitch abroad, and leſſened his intereſt and favour at home." In the publication of this book, the doctor took particular care of the punctuation. In the annotations, he ſelected what appeared the beſt and moſt judicious in former editors, with ſome corrections and emendations of his own interſperſed. Mr Addiſon has ſpoken of this folio edition of Cæſar's commentaries in the following words: "The new edition, which is given us of Cæſar's commentaries, has already been taken notice of in foreign gazettes, and is a work that does honour to the Engliſh preſs. It is no wonder that an edition ſhould be very correct, which has paſſed through the hands of one of the moſt accurate, learned, and judicious writers this age has produced. The beauty of the paper, of the character, and of the ſeveral cuts with which this noble work is illuſtrated, makes it the fineſt book that I have ever ſeen; and is a true inſtance of the Engliſh genius, which, though it does not come the firſt into any art, generally carries it to greater heights than any other country in the world." This noble work has riſen in value from that time to the preſent. A copy of this edition in large paper, moſt ſplendidly bound in morocco, was ſold at the Hon. Mr Beauclerk's ſale for forty-four pounds; and it was ſaid to be purchaſed by the duke of Grafton. "To a prince or a nobleman (ſays Dr Harwood), it was a cheap purchaſe; for it was the moſt magnificent book I ever beheld." The binding coſt Mr Beauclerk five guineas.

The ſame year, 1712, he publiſhed his celebrated book entitled, "The Scripture Doctrine of the Trinity, &c." which is divided into three parts. The firſt is, a collection and explication of all the texts in the "New Teſtament," relating to the doctrine of the Trinity: in the ſecond, the foregoing doctrine is ſet forth at large, and explained in particular and diſtinct propoſitions; and in the third, the principal paſſages in the liturgy of the church of England, relating to the doctrine of the Trinity, are conſidered. Biſhop Hoadly applauds our author's method of proceeding, in forming his ſentiments upon ſo important a point: "He knew (ſays he), and all men agreed, that it was a matter of mere revelation. He did not therefore retire into his cloſet, and ſet himſelf to invent and forge a plauſible hypotheſis, which might ſit eaſily upon his mind. He had not recourſe to abſtract and metaphyſical reaſonings to cover or patronize any ſyſtem he might have embraced before. But, as a Chriſtian, he laid open the New Teſtament before him. He ſearched out every text in which mention was made of the three perſons, or any one of them. He accurately examined the meaning of the words uſed about every one of them; and by the beſt rules of grammar and critique, and by his ſkill in language, he endeavoured to fix plainly what was declared about every perſon, and what was not. And what he thought to be the truth, he publiſhed under the title of 'The Scripture Doctrine of the Trinity.' "I am far (ſays the biſhop) from taking upon me to determine, in ſo difficult a queſtion between him and thoſe who made replies to him; but this I hope I may be allowed to ſay, that every Chriſtian divine and laymen ought to pay his thanks to Dr Clarke for the method into which he brought this diſpute; and for that collection of texts of the New Teſtament by which at laſt it muſt be decided, on which ſide ſoever the truth may be ſuppoſed to lie." Whiſton informs us, that ſome time before the publication of this book, there was a meſſage ſent to him from Lord Godolphin and others of Queen Anne's miniſters, importing, "That the affairs of the public were with difficulty then kept in the hands of thoſe that were for liberty; that it was therefore an unſeaſonable time for the publication of a book that would make a great noiſe and diſturbance; and that therefore they deſired him to forbear till a fitter opportunity ſhould offer itſelf;" which meſſage (ſays he) the doctor had no regard to, but went on according to the dictates of his own conſcience with the publication of his book. The miniſters, however, were very right in their conjectures; for the work made noiſe and diſturbance enough, and occaſioned a great number of books and pamphlets, written by himſelf and others.

Books and pamphlets, however, were not all which the "Scripture Doctrine of the Trinity" occaſioned: it made its author obnoxious to the power eccleſiaſtical, and his book to be complained of by the Lower Houſe of convention. The doctor drew up a preface, and afterwards gave in ſeveral explanations, which ſeemed to ſatisfy the Upper Houſe; at leaſt the affair was not brought to any iſſue, the members appearing deſirous to prevent diſſentions and diviſions.

In 1715 and 1716, he had a diſpute with the celebrated Leibnitz, relating to the principles of natural philoſophy and religion; and a collection of the papers which paſſed between them was publiſhed in 1717. This performance of the doctor's is inſcribed to her late Majeſty Queen Caroline, then princeſs of Wales, who was pleaſed to have the controverſy paſs through her hands. It related chiefly to the important and difficult ſubjects of liberty and neceſſity.

In 1718, Dr Clarke made an alteration in the forms of doxology in the ſinging pſalms, which produced no ſmall noiſe and diſturbance, and occaſioned ſome pamphlets to be written. The alteration was this:

To God, through Chriſt, his only Son,
Immortal glory be, &c.
And,
To God, through Chriſt, his Son, our Lord,
All glory be therefore, &c.

A conſiderable number of theſe ſelect pſalms and hymns having been diſperſed by the Society for Promoting Chriſtian Knowledge, before the alteration of the doxologies was taken notice of, he was charged with a deſign of impoſing upon the ſociety; whereas, in truth, the edition of them had been prepared by him for the uſe of his own pariſh only, before the ſociety had thoughts of purchaſing any of the copies; and as the uſual forms of doxology are not eſtabliſhed by any legal authority, eccleſiaſtical or civil, in this he had not offended.

About this time he was preſented by the lord Lechmere, the chancellor of the duchy of Lancaſter, to the maſterſhip of Wigſton's hoſpital in Leiceſter. In 1724, he publiſhed 17 ſermons preached on ſeveral occaſions, 11 of which were never before printed; and the year following, a ſermon, preached at the pariſh-church of St James's, upon the erecting a charity-ſchool for the education of women ſervants. In 1727, upon the death of Sir Iſaac Newton, he was offered by the court the place of maſter of the mint, worth *communibus annis* 1200 or 1500l. a-year. But to this ſecular preferment he could not reconcile himſelf, and therefore abſolutely refuſed it. Whiſton ſeems to wonder, that Clarke's eulogiſts ſhould lay ſo little ſtreſs upon this refuſal, as to mention it not at all, or at leaſt very negligently; while "he takes it," he ſays, "to be one of the moſt glorious actions of his life, and to afford undeniable conviction, that he was in earneſt in his religion." In 1728, was publiſhed, "A Letter from Dr Clarke to Mr Benjamin Hoadly, F. R. S. occaſioned by the controverſy, relating to the Proportion of Velocity and Force in Bodies in Motion;" and printed in the Philoſophical Tranſactions, N° 401.

In 1729, he publiſhed the 12 firſt books of "Homer's Iliad." This edition was printed in 4to, and dedicated to the duke of Cumberland. The Latin verſion is almoſt entirely new, and annotations are added to the bottom of the pages. Homer, Biſhop Hoadly tells us, was Clarke's admired author, even to a degree of ſomething like enthuſiaſm, hardly natural to his temper, and that in this he went a little beyond the bounds of Horace's judgment, and was ſo unwilling to allow the favourite poet ever to nod, that he has taken remarkable pains to find out, and give a reaſon for every paſſage, word, and title, that could create any ſuſpicion. "The tranſlation, (adds the Biſhop), with his corrections, may now be ſtyled accurate, and his notes, as far as they go, are indeed a treaſury of grammatical and critical knowledge. He was called to his taſk by royal command; and he has performed it in ſuch a manner, as to be worthy of the young prince, for whom it was laboured." The year of its publication was the laſt of this great man's life. Though not robuſt, he had always enjoyed a firm ſtate of health, without any diſpoſition bad enough to confine him, except the ſmall-pox in his youth; till on Sunday May 11. 1729, going out in the morning to preach before the judges at Sergeant's-Inn, he was there ſeized with a pain in his ſide, which made it impoſſible for him to perform the office he was called to; and quickly became ſo violent, that he was obliged to be carried home. He went to bed, and thought himſelf ſo much better in the afternoon, that he would not ſuffer himſelf to be bled; againſt which remedy, it is remarkable that he had entertained ſtrong prejudices. But the pain returning violently about two the next morning, made bleeding abſolutely neceſſary; he appeared to be out of danger, and continued to think himſelf ſo, till the Saturday morning following; when, to the inexpreſſible ſurpriſe of all about him, the pain removed from his ſide to his head; and, after a very ſhort complaint, took away his ſenſes ſo, that they never returned any more. He continued breathing till between ſeven and eight of the evening of that day, which was May 17. 1729; and then died, in his 54th year.

Soon after his death were publiſhed, from his original manuſcripts, by his brother Dr John Clarke, dean of Sarum, "An Expoſition of the Church Catechiſm," and ten volumes of ſermons, in 8vo. His "Expoſition" is made up of thoſe lectures he read every Thurſday morning for ſome months in the year, at St James's church. In the latter part of his time he reviſed them with great care, and left them completely prepared for the preſs. As to the ſermons, few diſcourſes in the Engliſh language are more judicious, and fewer ſtill are equally inſtructive. The reaſoning and the practical parts are excellent, and the explanations of Scripture are uncommonly valuable. Though Dr Clarke had not the turn of mind which qualified him for moving the paſſions, and indeed did not make it his object, his ſentiments, nevertheleſs, are frequently expreſſed with ſuch a clearneſs of conception and ſuch a force of language, as to produce in well diſpoſed readers all the effect of the pathetic. Several volumes of ſermons have been publiſhed ſince his time, which are far ſuperior in point of elegance and beauty, and we have the higheſt ſenſe of their merit. But ſtill if we were called upon to recommend diſcourſes, which abound with the moſt ſolid inſtruction, and promiſe the moſt laſting improvement, we ſhould never forget a Clarke and a Jortin. Three years after the doctor's death appeared alſo the Twelve Laſt books of the Iliad. publiſhed in 4to by his ſon Mr Samuel Clarke, who informs us, in the preface, that his father had finiſhed the annotations to the three firſt of theſe books, and as far as the 359th verſe of the fourth; and had reviſed the text and verſion as far as verſe 510 of the ſame book. Dr Clarke married Catharine, the daughter of the Reverend Mr Lockwood, rector of Little Miſſingham in Norfolk; in whoſe good ſenſe and unblameable behaviour he was happy to his death. By her he had ſeven children, two of whom died before and one a few weeks after him.

Of the character of this great divine, the following ſhort delineation appeared ſome years ſince in the Gentleman's Magazine: "Samuel Clarke, D. D. rector of St James's, Weſtminſter: in each ſeveral part of uſeful knowledge and critical learning, perhaps without a ſuperior; in all united, certainly without an equal: in his works, the beſt defender of religion; in his practice, the greateſt ornament to it; in his converſation communicative, and in an uncommon manner inſtructive; in his preaching and writings, ſtrong, clear, and calm; in his life, high in the eſteem of the wiſe, the good, and the great; in his death, lamented by every friend to learning, truth, and virtue." In the ſame publication ſome not incurious anecdotes concerning him are printed, collected by the Rev. Mr Jones of Welwyn. We learned from them, that Dr Clarke was of a very humane and tender diſpoſition. When his young children amuſed themſelves with tormenting and killing flies upon the windows, he not only forbade ſuch practiſes, but calmly reaſoned with them, in ſuch a familiar manner, as was calculated to make a powerful impreſſion upon their minds. He was very ready and condeſcending in anſwering applications to him with reſpect to ſcruples; numberleſs inſtances of which occurred in the courſe of his life. One thing of which Dr Clarke was peculiarly cautious, was not to loſe the leaſt minute of his time. He always carried ſome book about with him, which he would read whilſt riding in a coach, or walking in the fields, or if he had any leiſure moments free from company or his other ſtudies. Nay, he would read even in company itſelf, where he might take ſuch a liberty without offence to good manners. His memory was remarkably ſtrong. He told Mr Pyle of Lyn, that he never forgot any thing which he had once thoroughly apprehended and underſtood. The Doctor, with his intimate friends, was perfectly free and eaſy; but if ſtrangers were introduced, he behaved with much circumſpection, converſing only upon common topics.

When he viſited Dr Sykes, his uſual way was to ſit with him upon a couch, and, reclining upon his boſom, to diſcourſe with him, in the moſt familiar manner, upon ſuch ſubjects as were agreeable to the taſte and judgment of both. When Sir John Germaine lay upon his deathbed, and was in great confuſion and trouble of mind, he ſent for Dr Clarke, and requeſted to know of him whether he ſhould receive the ſacrament, and what he ſhould do in his ſad condition. The Doctor, who was well acquainted with Sir John's purſuits and courſe of life, ſedately replied, that he could not adviſe him to receive the ſacrament, and that he did not think it likely to be of any avail to him with reſpect to his final welfare. Having ſaid this, he departed without adminiſtering the communion, having firſt recommended the dying man to the mercy of God.

Dr Clarke was of a cheerful, and even playful diſpoſition. An intimate friend of his, the late Rev. Mr Bott, uſed to relate, that once when he called upon him, he found him ſwimming upon a table. At another time, when the two Dr Clarkes, Mr Bott, and ſeveral men of ability and learning were together, and amuſing themſelves with diverting tricks, Dr Samuel Clarke, looking out of the window, ſaw a grave blockhead approaching to the houſe; upon which he cried out, "Boys, boys, be wiſe, here comes a fool." This turn of his mind hath ſince been confirmed by Dr Warton, who, in his obſervations on the following line of Mr Pope,

> "Unthought of frailties cheat us in the wiſe,"

ſays, "Who could imagine that Locke was fond of romances; that Newton once ſtudied aſtrology; that Dr Clarke valued himſelf on his agility, and frequently amuſed himſelf, in a private room of his houſe, in leaping over the tables and chairs; and that our author himſelf was a great epicure?" With reſpect to what is here recorded of Dr Clarke, we can ſcarcely perſuade ourſelves to conſider it as a frailty. To be poſſeſſed of ſuch a temper as he was, muſt have been no ſmall degree of happineſs; as it probably enabled him to purſue his important and ſerious ſtudies with greater vivacity and vigour. To be capable of deriving amuſement from trivial circumſtances, indicates a heart at eaſe, and may generally be regarded as the concomitant of virtue.

Clarke, *William*, an Engliſh divine, was born at Haghmon abbey in Shropſhire, 1696; and after a grammar-education at Shrewſbury ſchool, was ſent to St John's college Cambridge, of which he was elected fellow, Jan. 17. 1716; B. A. 1731; M. A. 1735. He was preſented by Archbiſhop Wake in 1724 to the rectory of Buxted in Suſſex, at the particular recommendation of Dr Wotton, whoſe daughter he married. In 1738 he was made prebendary and reſidentiary of the cathedral church of Chicheſter. Some years before this he had given to the public a ſpecimen of his literary abilities, in a preface of his father-in-law Dr Wotton's *Leges Walliæ Eccleſiaſticæ et Civiles Hoeli Boni, et aliorum Walliæ Principum*; or Eccleſiaſtical and Civil Laws of Howel D Da, and other princes of Wales. There is reaſon likewiſe to ſurmiſe, that an excellent Diſcourſe on the Commerce of the Romans, which was highly extolled by Dr Taylor in his Elements of the Civil Law, might have been written by our author. It came either from his hand or from that of his friend Mr Bowyer, and is reprinted in that gentleman's Miſcellaneous Tracts. But Mr Clarke's chief work was, The Connexion of the Roman, Saxon, and Engliſh Coins; deducing the Antiquities, Cuſtoms, and Manners of each people to modern times; particularly the Origin of Feudal Tenures, and of Parliaments; Illuſtrated throughout with critical and hiſtorical Remarks on various Authors, both ſacred and profane. This work was publiſhed, in one volume quarto, in 1767; and its appearance from the preſs was owing to the diſcovery made by Martin Folkes, Eſq. of the old Saxon pound. It was dedicated to the duke of Newcaſtle, whoſe beneficent diſpoſition is celebrated for having conferred obligations upon the author, which were not the effects of importunity. Mr Clarke's performance was peruſed in manuſcript by Arthur Onſlow, Eſq. ſpeaker of the houſe of commons, who honoured him with ſome uſeful hints and obſervations; but he was chiefly indebted to Mr Bowyer, who took upon him all the care of the publication, drew up ſeveral of the notes, wrote part of the diſſertation on the Roman ſeſterce, and formed an admirable index to the whole. By this work our author acquired a great and juſt reputation. Indeed, it reflects honour upon the country by which it is produced; for there are few performances that are more replete with profound and curious learning. Mr Clarke's laſt promotions were the chancellorſhip of the church of Chicheſter, and the vicarage of Amport, which were beſtowed upon him in 1770. Theſe preferments he did not long live to enjoy, departing this life on the 21ſt of October, in the following year. He had reſigned in 1768, the rectory of Buxted to his ſon Edward. In Mr Nichols's Anecdotes of Bowyer, there are ſeveral letters and extracts of letters written to that learned printer by Mr Clarke, which diſplay him to great advantage as a man of piety, a friend, and a ſcholar.

In a ſketch of his character in the *Biographia Britannica*, furniſhed by Mr Hayley, who was his intimate acquaintance, he is repreſented as not only a man of extenſive erudition, but as poſſeſſed of the pleaſing talent of communicating his various knowledge in familiar converſation, without any appearance of pedantry or preſumption. Antiquities were the favourite ſtudy of Mr Clarke, as his publications ſufficiently ſhow; but he was a ſecret, and by no means an unſucceſsful, votary of the muſes. He wrote Engliſh verſe with eaſe, elegance, and ſpirit. Perhaps there are few better epigrams in our language than the following, which he compoſed on ſeeing the words *Domus ultima* inſcribed on the vault belonging to the dukes of Richmond in the cathedral of Chicheſter.

> Did he, who thus inſcrib'd the wall,
> Not read, or not believe, St Paul,
> Who ſays there is, where'er it ſtands,
> Another houſe not made with hands?
> Or, may we gather from theſe words,
> That houſe is not a houſe of lords?

Among the happier little pieces of his ſportive poetry, there were ſome animated ſtanzas, deſcribing the character of the twelve Engliſh poets, whoſe portraits, engraved by Vertue, were the favourite ornament of his parlour: but he ſet ſo modeſt and humble a value on his poetical compoſitions, that they were ſeldom committed to paper, and are therefore very imperfectly preſerved in the memory of thoſe to whom he ſometimes recited them. His taſte and judgment in poetry appears indeed very ſtriking in many parts of his learned and elaborate *Connexion of Coins*. His illuſtration of Neſtor's cup, in particular, may be eſteemed as one of the happieſt examples of that light and beauty which the learning and ſpirit of an elegant antiquarian may throw on a cloudy and miſtaken paſſage of an ancient poet. In ſtrict attention to all the duties of his ſtation, in the moſt active and unwearied charity, he might be regarded as a model to the miniſters of God. Though his income was never large, it was his cuſtom to devote a ſhilling in every guinea that he received to the ſervice of the poor. As a maſter, as a huſband, and a father, his conduct was amiable and endearing; and to cloſe this imperfect ſketch of him with his moſt ſtriking features, he was a man of genuine unaffected piety.

CLARO-OBSCURO, or CLAIR-OBSCURE, in painting, the art of diſtributing to advantage the lights and ſhades of a piece, both with reſpect to the eaſing of the eye and the effect of the whole piece. See PAINTING.

Claro-Obſcuro, or *Chiaro-ſcuro*, is alſo uſed to ſignify a deſign conſiſting only of two colours, moſt uſually black and white, but ſometimes black and yellow; or it is a deſign waſhed only with one colour, the ſhadows being of a duſky brown, and the lights heightened up by white.

The word is alſo applied to prints of two colours taken off at twice; whereof there are volumes in the cabinets of thoſe who are curious in prints.

CLARUS, or CLAROS, in *Ancient Geography*, a town of Ionia, famous for an oracle of Apollo. It was built by Manto, daughter of Tireſias, who fled from Thebes after it had been deſtroyed by the Epigoni. She was ſo afflicted with her misfortunes, that a lake was formed with her tears, where ſhe firſt founded the oracle. Apollo was from thence ſurnamed *Clarius*. Alſo an iſland of the Ægean ſea, between Tenedos and Scios.

CLARY. See SALVIA, BOTANY *Index*.

Clary-Water, is compoſed of brandy, ſugar, clary-flowers, and cinnamon, with a little ambergris diſſolved in it. It helps digeſtion, and is cardiac. This water is rendered either purgative or emetic, by adding reſin of jalap and ſcammony, or *crocus metallorum*. Some make clary-water of brandy, juice of cherries, ſtrawberries, and gooſeberries, ſugar, cloves, white pepper, and coriander ſeeds; infuſed, ſuggared, and ſtrained.

CLASMIUM, in *Natural Hiſtory*, the name of a genus of foſſils, of the claſs of the gypſums; the characters of which are, that they are of a ſoft texture, and of a dull opaque look, being compoſed, as all the other gypſums, of irregularly arranged flat particles.

The word is derived from the Greek κλασμος, a fragment or ſmall particle; from the flaky ſmall particles of which theſe bodies are compoſed. Of this genus there is only one known ſpecies: this is of a tolerably regular and even ſtructure; though very coarſe and harſh to the touch. It is of a very lively and beautiful red in colour; and is found in thick roundiſh maſſes, which, when broken, are to be ſeen compoſed of irregular arrangements of flat particles; and emulate a ſtriated texture. It will neither give fire with ſteel nor ferment with acids; but calcines very freely and eaſily, and affords a very valuable plaſter of Paris, as do all the purer gypſums. It is common in Italy, and is greatly eſteemed there; it is alſo found in ſome parts of England, particularly Derbyſhire, but there it is not much regarded.

CLASPERS, or TENDRILS. See CIRRHUS.

CLASS, an appellation given to the moſt general ſubdiviſions of any thing; thus, *animal* is ſubdivided into the claſſes quadrupeds, birds, fiſhes, &c. which are again ſubdivided into ſerieſes or orders; and theſe laſt into genera. See BOTANY.

CLASS, is alſo uſed in ſchools, in a ſynnnymous ſenſe with *form*, for a number of boys all learning the ſame thing.

CLASSIC, or CLASSICAL, an epithet, chiefly applied to authors read in the claſſes at ſchools.

This term ſeems to owe its origin to Tullius Servius, who, in order to make an eſtimate of every perſon's eſtate, divided the Roman people into ſix bands, which be called *claſſes*. The eſtate of the firſt claſs was not to be under 200l. and theſe by way of eminence were called *claſſici*, "claſſics:" hence authors of the firſt rank came to be called *claſſics*, all the reſt being ſaid to be *infra claſſem*: thus Ariſtotle is a claſſic author in philoſophy; Aquinas in ſchool divinity, &c.

CLASSICUM was the alarm for battle, given by the Roman generals, and ſounded by trumpets and other martial muſic throughout the army.

CLATHRI, in antiquity, bars of wood or iron, uſed in ſecuring doors and windows. There was a goddeſs called *Clathra*, that preſided over the clathri.

CLAVARIA, CLUB-TOP. See BOTANY *Index*.

CLAVARIUM, in antiquity, an allowance the Roman ſoldiers had for furniſhing nails to ſecure their ſhoes with. They raiſed frequent mutinies, demanding largeſſes of the emperors under this pretence.

CLAVATA VESTIMENTA, in antiquity, habits adorned with purple clavi, which were either broad or narrow. See CLAVUS.

CLAUBERG, JOHN, a learned profeſſor of philoſophy and divinity at Diuſburg, was born at Solingen in 1622. He travelled into Holland, France, and England, and in each country obtained the eſteem of the learned. The elector of Brandenburg gave him public teſtimonies of his eſteem. He died in 1665. His works were printed at Amſterdam in 2 vols 4to. The moſt celebrated of theſe is his treatiſe, entitled *Logica vetus et nova*, &c.

CLAUDE le LORRAIN, or CLAUDE GELEE, a celebrated landſcape painter, and a ſtriking example of the efficacy of induſtry to ſupply, or at leaſt to call forth genius. Claude was born in the dioceſe of Toul in Lorraine in 1600; and, being dull and heavy at ſchool, was put an apprentice to a paſtry-cook: he afterwards rambled to Rome to ſeek a livelihood; but, being very ill-bred, and unacquainted with the language, nobody cared to employ him. Chance threw him at laſt in the way of Auguſtin Taſſi, a painter, who hired him to grind his colours, and to do all the houſehold drudgery. His maſter hoping to make him ſerviceable to him in ſome of his greateſt works, taught him by degrees the rules of perſpective and the elements of deſign. Claude at firſt did not know what to make of thoſe principles of art; but being encouraged, and not failing in application, he came at length to underſtand them. Then his ſoul enlarged itſelf apace, and cultivated the art with wonderful eagerneſs. He exerted his utmoſt induſtry to explore the true principles of painting by an inceſſant examination of nature, that genuine ſource of excellence; for which purpoſe, he made his ſtudies in the open fields; where he very frequently continued from ſunriſe till the duſk of the evening compelled him to withdraw himſelf from his contemplations. It was his cuſtom to ſketch whatever he thought beautiful or ſtriking; and every curious tinge of light, on all kinds of objects, he marked in his ſketches, with a ſimilar colour; from which he perfected his landſcapes with ſuch a look of real nature, and gave them ſuch an appearance of truth, as proved ſuperior to any artiſt that had ever painted in that ſtyle.

The beauties of his paintings are derived from nature herſelf, which he examined with uncommon aſſiduity; and Sandrart relates, that Claude uſed to explain to him, as they walked through the fields, the cauſes of the different appearances of the ſame proſpect at different hours of the day, from the reflections or refractions of light, from dews or vapours in the evening or morning, with all the preciſion of a philoſopher. He worked on his pictures with great care, endeavouring to bring them to perfection, by touching them frequently over again; and if any performance did not anſwer his ideas, it was cuſtomary with him to alter, to deface, and repaint it ſeveral times over, till it correſponded with the image pictured in his mind. But whatever ſtruck his imagination, while he obſerved nature abroad, it was ſo ſtrongly impreſſed on his memory, that on his return to his work, he never failed to make the happieſt uſe of it.

His ſkies are warm and full of luſtre, and every object is properly illumined. His diſtances are admirable, and in every part a delightful union and harmony not only excite our applauſe but our admiration. His invention is pleaſing, his colouring delicate, and his tints have ſuch an agreeable ſweetneſs and variety, as have been but imperfectly imitated by the beſt ſubſequent artiſts, but were never equalled. He frequently gave an uncommon tenderneſs to his finiſhed trees by glazing; and in his large compoſitions which he painted in freſco, he was ſo exact that the diſtinct ſpecies of every tree might readily be diſtinguiſhed. As to his figures, when he painted them himſelf, they are very indifferent; but he was ſo conſcious of his deficiency in this reſpect, that he uſually engaged other artiſts who were eminent to paint them for him; of which number were Courtois and Philippo Laura. His pictures are now very rare, eſpecially ſuch as are undamaged; and thoſe are at this time ſo valued, that no price, however great, is thought to be ſuperior to their merit. In order to avoid a repetition of the ſame ſubject, and alſo to detect ſuch copies of his works as might be injurious to his fame, by being ſold for originals, it was his cuſtom to draw (in a paper-book prepared for this purpoſe) the deſigns of all thoſe pictures which were tranſmitted to different countries; and on the back of the drawings, he wrote the name of the perſon who had been the purchaſer. That book, which he titled *Libro di Verita*, is now in the poſſeſſion of the duke of Devonſhire.

CLAUDE, *John*, a Proteſtant divine, born in the province of Angenois in 1619. Meſſ. de Port Royal uſing their utmoſt endeavours to convert M. de Turenne to the Catholic faith, preſented him with a piece calculated to that end, which his lady engaged Mr Claude to anſwer; and his performance gave riſe to the moſt famous controverſy that was ever carried on in France between the Roman Catholics and Proteſtants. On the revocation of the edict of Nantz, he retired to Holland, where he met with a kind reception, and was honoured with a conſiderable penſion by the prince of Orange. He died in 1687; and left a ſon, Iſaac Claude, whom he lived to ſee miniſter of the Walloon church at the Hague, and who publiſhed ſeveral excellent works of his deceaſed father.

CLAUDIA, a veſtal virgin at Rome, who being ſuſpected of unchaſtity, is ſaid to have been cleared from that imputation in the following manner: the image of Cybele being brought out of Phrygia to Rome in a barge, and it happening to ſtick ſo faſt in the river Tiber that it could not be moved, ſhe tying her girdle, the badge of chaſtity, to the barge, drew it along to the city, which a thouſand men were unable to do.

Claudia Aqua (Frontinus), water conveyed to Rome by a canal or aqueduct of eleven miles in length, the contrivance of Appius Claudius the Cenſor, and the firſt ſtructure of the kind, in the year of Rome 441. Called alſo *Aqua Appia*.

Claudia Copia (Inſcriptions), a name of *Lugdunum*, or Lyons in France, the birth place of the emperor Claudius: A Roman colony called *Claudia*, from its benefactor the emperor; and *Copia*, from its plenty of all neceſſaries, eſpecially corn. See Lugdunum.

Claudia, or *Clodia Via* (Ovid), was that road which, beginning at the Pons Milvius, joined the Flaminia, paſſing through Etruria on the ſouth ſide of the Lacus Sabatinus, and ſtriking off from the Caſſia, and leading to Luca (Antonine): large remains of it are to be ſeen above Bracciano (Holſtenius).

Claudia Lex, de Comitiis, was enacted by M. Cl. Marcellus in the year of Rome 702. It ordained, that at public elections of magiſtrates no notice ſhould be taken of the votes of ſuch as were abſent. Another, *de Uſura*, which forbade people to lend money to minors on condition of payment, after the deceaſe of their parents. Another, *de Negotiatione*, by Q. Claudius the tribune, 535. It forbade any ſenator or father of a ſenator to have any veſſel containing above 300 amphoræ, for fear of their engaging themſelves in commercial ſchemes. The ſame law alſo forbade the ſame thing to the ſcribes and the attendants of the queſtors, as it was naturally ſuppoſed that people who had any commercial connexions could not be faithful to their truſt, nor promote the intereſt of the ſtate. Another, 576, to permit the allies to return to their reſpective cities, after their names were inrolled. Liv. 41. c. 8. Another, to take away the freedom of the city of Rome from the coloniſts which Cæſar had carried to Novicomum.

CLAUDIANUS, Claudius, a Latin poet, flouriſhed in the 4th century, under the emperor Theodoſius, and under his ſons Arcadius and Honorius. It is not agreed of what country he was a native; but he came to Rome in the year of Chriſt 395, when he was about 30 years old; and there inſinuated himſelf into Stilicho's favour; who, being a perſon of great abilities both for civil and military affairs, though a Goth by birth, was ſo conſiderable a perſon under Honorius, that he may be ſaid for many years to have governed the weſtern empire. Stilicho afterwards fell into diſgrace, and was put to death; and it is more than probable that the poet was involved in the misfortunes of his patron, and ſeverely perſecuted in his perſon and fortunes by Hadrian, an Egyptian by birth, who was captain of the guards to Honorius, and ſucceeded Stilicho. There is reaſon, however, to think that he roſe afterwards to great favour, and obtained ſeveral honours both civil and military. The princeſs Serena had a great eſteem for Claudian, and recommended and married him to a lady of great quality and fortune in Libya. There are a few little poems on ſacred ſubjects, which through miſtake have been aſcribed by ſome critics to Claudian; and ſo have made him be thought a Chriſtian. But St Auſtin, who was contemporary with him, expreſsly ſays that he was a Heathen. The time of Claudian's death is uncertain, nor do we know any farther particulars of his life than what are to be collected from his works, and which we have already related above. He is thought to have more of Virgil in his ſtyle than all the other imitators of him.

Claudius I. Roman emperor, A. D. 41. The beginning of his reign was very promiſing; but it was ſoon diſcovered that little better than an idiot filled the throne, who might eaſily be made a tyrant: accordingly he became a very cruel one, through the influence of his empreſs, the infamous Meſſalina: after her death, he married his niece Agrippina, who cauſed him to be poiſoned to make room for Nero, A.D. 54. See (*Hiſtory of*) Rome.

Claudius II. *Aurelius*, ſurnamed *Gothicus*, ſignalized himſelf by his courage and prudence under the reigns of Valerian and Julian; and on the death of the latter was declared emperor in 268. He put to death Aureolus, the murderer of Gallienus; defeated the Germans; and in 269 marched againſt the Goths, who ravaged the empire with an army of 300,000 men, which he at firſt haraſſed, and the next year entirely defeated; but a contagious diſeaſe, which had ſpread through that vaſt army, was caught by the Romans; and the emperor himſelf died of it a ſhort time after, aged 56. Pollio ſays, that this prince had the moderation of Auguſtus, the virtue of Trajan, and the piety of Antoninus.

CLAVES insulæ, a term uſed in the iſle of Man, where all weighty and ambiguous cauſes are referred to a jury of twelve, who are called *claves inſulæ*, the keys of the iſland.

CLAVICHORD, and Clavicitherium, two muſical inſtruments uſed in the 16th century. They were of the nature of the ſpinet, but of an oblong figure. The firſt is ſtill uſed by the nuns in convents; and that the practitioners may not diſturb the ſiſters in the dormitory, the ſtrings are muffled with ſmall bits of fine woollen cloth.

CLAVICLE. See Anatomy *Index*.

CLAVICYMBALUM, in antiquity, a muſical inſtrument with 30 ſtrings. Modern writers apply the name to our harpſichords.

CLAVI vestium, were flowers or ſtuds of purple, interwoven with or ſewed upon the garments of knights or ſenators; only, for diſtinction, the former uſed them narrow, the latter broad.

CLAVIS properly ſignifies a key; and is ſometimes uſed in Engliſh to denote an explanation of ſome obſcure paſſages of any book in writing.

CLAVIUS, Christopher, a German Jeſuit,

born at Bamberg, excelled in the knowledge of the mathematics, and was one of the chief perſons employed to rectify the kalendar; the defence of which he alſo undertook againſt thoſe who cenſured it, eſpecially Scaliger. He died at Rome in 1612, aged 75. His works have been printed in five volumes folio; the principal of which is his Commentary on Euclid's Elements.

CLAUSE, in *Grammar*, denotes a member of a period or ſentence.

Clause ſignifies alſo an article or particular ſtipulation in a contract, a charge or condition in a teſtament, &c.

CLAUSENBURG, a large city of Tranſilvania, ſituated on the river Samos, in E. Long. 23. 20. N. Lat. 46. 53.

CLAVUS, in antiquity, an ornament upon the robes of the Roman ſenators and knights, which was more or leſs broad, according to the dignity of the perſon; hence the diſtinction of tunica anguſti-clavia and lati-clavia.

Clavus, in *Medicine* and *Surgery*, is uſed in ſeveral ſignifications: 1. Clavus hyſtericus, is a ſhooting pain in the head, between the pericranium and cranium, which affects ſuch as have the green ſickneſs. 2. Clavus oculorum, according to Celſus, is a callous tubercle on the white of the eye, taking its denomination from its figure. 3. Clavus imports indurated tubercles of the uterus. 4. It alſo imports a chirurgical inſtrument of gold, mentioned by Amatus Luſitanus, deſigned to be introduced into an exulcerated palate, for the better articulation of the voice. And, 5. It ſignifies a callus, or corn on the foot.

Clavus Annalis, in antiquity. So rude and ignorant were the Romans towards the riſe of their ſtate, that the driving or fixing a nail was the only method they had of keeping a regiſter of time; for which reaſon it was called *clavus annalis*. There was an ancient law, ordaining the chief prætor to fix a nail every year on the Ides of September; it was driven into the right ſide of the temple of Jupiter Opt. Max. towards Minerva's temple. This cuſtom of keeping an account of time by means of fixing nails was not peculiar to the Romans; for the Etrurians uſed likewiſe to drive nails into the temple of their goddeſs Nortia with the ſame view.

CLAW, among zoologiſts, denotes the ſharp-pointed nails with which the feet of certain quadrupeds and birds are furniſhed.

CLAY, in *Natural Hiſtory*, a genus of earths, the characters of which are theſe: They are firmly coherent, weighty, and compact; ſtiff, viſcid, and ductile to a great degree, whilſt moiſt; ſmooth to the touch; not eaſily breaking between the fingers, nor readily diffuſible in water; and, when mixed, not readily ſubſiding from it. See Chemistry and Mineralogy *Index*.

Clay, a town of Norfolk in England, ſeated on an arm of the ſea between two rivers, in E. Long. 0. 30. N. Lat. 47. 28.

Clay-Lands, thoſe abounding with clay, whether black, blue, yellow, white, &c. of which the black and the yellow are the beſt for corn.

All clay ſoils are apt to chill the plants growing on them in moiſt ſeaſons, as they retain too much water: in dry ſeaſons, on the contrary, they turn hard and choke the plants. The natural produce of clay ſoils is gooſe-graſs, large daiſies, thiſtles, docks, poppies, &c. Some bear, clover, and rye-graſs; and, if well manured, produce the beſt grain: they hold manure the beſt of all lands; and the moſt proper for them are horſe dung, pigeons dung, ſome kinds of marle, folding of ſheep, malt-duſt, aſhes, chalk, lime, ſoot, &c.

CLAYTON, Dr Robert, a prelate of great learning, of diſtinguiſhed worth and probity, and a reſpectable member of the Royal and Antiquarian Societies at London, was advanced to the biſhopric of Killala, Jan. 23. 1729; tranſlated to the ſee of Corke, Dec. 19. 1735; to that of Clogher, Aug. 26. 1745; and died much lamented, Feb. 25. 1758. His publications are, 1. a Letter in the Philoſophical Tranſactions, n° 461. p. 813. giving an account of a Frenchman 70 years old (at Iniſhanan, in his dioceſe of Corke), who ſaid he gave ſuck to a child.—2. The Chronology of the Hebrew Bible vindicated, &c. 1751, 4to.—3. An impartial Inquiry into the time of the Coming of the Meſſiah, 1751, 8vo.—4. An Eſſay on Spirit, 1751, 8vo.—5. A Vindication of the Hiſtories of the Old and New Teſtament, in Anſwer to the Objections of the late Lord Bolingbroke; in Two Letters to a young Nobleman, 1752, 8vo, reprinted in 1753.—6. A Defence of the Eſſay on Spirit, with Remarks on the ſeveral pretended Anſwers; and which may ſerve as an antidote againſt all that ſhall ever appear againſt it, 1753, 8vo.—7. A Journal from Grand Cairo to Mount Sinai, and back again, tranſlated from a Manuſcript, written by the Prefetto of Egypt, in Company with ſome Miſſionaries *de propaganda fide* at Grand Cairo: to which are added, Remarks on the Origin of Hieroglyphics, and the Mythology of the ancient Heathens, 1753, 8vo, two editions 4to and 8vo. It was ſoon after this publication that his Lordſhip became (in March 1754) a fellow of the Society of Antiquarians.—8. Some Thoughts on Self-love, Innate Ideas, Free-will, Taſte, Sentiments, Liberty, and Neceſſity, &c. occaſioned by reading Mr Hume's Works, and the ſhort Treatiſe written in French by Lord Bolingbroke on Compaſſion, 1754, 8vo.—9. A Vindication of the Hiſtories of the Old and New Teſtament, Part II. Adorned with ſeveral Explanatory Cuts, 1754, 8vo.—10. Letters between the biſhop of Clogher and Mr William Penn, concerning Baptiſm, 1755, 8vo.—11. A Speech made in the Houſe of Lords in Ireland, on Monday, February 2. 1756, for omitting the Nicene and Athanaſian Creeds out of the Liturgy, &c. 1756, 8vo.—11. A Vindication, Part III. 1758. 8vo. The three parts of the Eſſay on Spirit were reprinted by Mr Bowyer, in one vol. 8vo, 1759; with ſome additional notes, and an index of texts of Scripture illuſtrated or explained.

CLAYTONIA. See Botany *Index*.

CLAZOMENÆ,-arum, (Herodotus, Strabo, Velleius, Pliny); *Clazomena, æ*, (Mela); one of the twelve ancient cities of Ionia. The country of Anaxagoras; ſituated in the neighbourhood of Colophon. The city was ſmall, its port on the N. N. W. ſide of the iſland. Dr Chandler informs us, that traces of the walls are found by the ſea; and in a hill are veſtiges of a theatre. Three or four trees grow on it; and by one is a cave hewn in the rock, and affording water. A vaulted room with a chimney at one end, and a hovel or two made with ſtones piled, are all the preſent ſtructures; and theſe are chiefly frequented by fiſhermen and by perſons employed to watch and to drive away birds when the grain ripens. Referring to this confined ſituation of Clazomenæ, a famous ſophiſt, when importuned to adorn his native city by reſiding in it rather than at Smyrna, replied, *The nightingale refuſes to ſing in a cage.*

CLEANTHES, a Stoic philoſopher, diſciple of Zeno, flouriſhed 240 years before Chriſt. He maintained himſelf in the day by working in the night: being queſtioned by the magiſtrates how he ſubſiſted, he brought a woman for whom he kneaded bread, and a gardener for whom he drew water; and refuſed a preſent from them. He compoſed ſeveral works, of which there are now only a few fragments remaining.

CLEAR, as a naval term, is variouſly applied to the weather, the ſea-coaſts, cordage, navigation, &c. The weather is ſaid to be clear when it is fair and open, as oppoſed to cloudy or foggy. The ſea coaſt is called clear when the navigation is not interrupted, or rendered dangerous by rocks, ſands, or breakers, &c. It is expreſſed of cordage, cables, &c. when they are unembarraſſed or diſentangled, ſo as to be ready for immediate ſervice. It is uſually oppoſed to *foul* in all theſe ſenſes.

CLEARCHUS, a tyrant of Heraclea in Pontus, who was killed by Chion and Leonidas, Plato's pupils, during the celebration of the feſtivals of Bacchus. He had enjoyed the ſovereign power during 12 years. A Lacedæmonian ſent to quiet the Byzantines. He was recalled, but refuſed to obey, and fled to Cyrus the younger, who made him captain of 13,000 Greek ſoldiers. He obtained a victory over Artaxerxes, who was ſo enraged at the defeat, that when Clearchus fell into his hands by the treachery of Tiſſaphernes, he put him immediately to death.

CLEATS, in naval affairs, pieces of wood having one or two projecting ends whereby to faſten the ropes: ſome of them are faſtened to the ſhrouds below for this purpoſe, and others nailed to different places of the ſhip's deck or ſides.

CLECHE, in *Heraldry*, a kind of croſs, charged with another croſs of the ſame figure, but of the colour of the field.

CLEDGE, among miners, denotes the upper ſtratum of fullers earth.

CLEDONISM, CLEDONISMUS) a kind of divination, in uſe among the ancients. The word is formed from κληδων which ſignifies two things, *rumor*, "a report," and *avis*, "a bird." In the firſt ſenſe, cledoniſm ſhould denote a kind of divination drawn from words occaſionally uttered. Cicero obſerves, that the Pythagoreans made obſervation not only of the words of the gods, but of thoſe of men; and accordingly believed the pronouncing of certain words, e. g. *incendium*, at a meal, very unhappy. Thus, inſtead of priſon, they uſed the word *domicilium*; and to avoid *erinnys*, furies, ſaid *eumenides*. In the ſecond ſenſe, *cledoniſm* ſhould ſeem a divination drawn from birds; the ſame with ornithomantia.

CLEEVERS. See CLIVERS.

CLEF, or CLIFF, in *Muſic*, derived from the Latin word *clavis*, "a key;" becauſe by it is expreſſed the fundamental ſound in the diatonic ſcale, which requires a determined ſucceſſion of tones or ſemitones, whether major or minor, peculiar to the note from whence we ſet out, and reſulting from its poſition in the ſcale. Hence, as it opens a way to this ſucceſſion, and diſcovers it, the technical term *key* is uſed with great propriety. But clefs rather point out the poſition of different muſical parts in the general ſyſtem, and the relations which they bear one to another.

A clef, ſays Rouſſeau, is a character in muſic placed at the beginning of a ſtave, to determine the degree of elevation occupied by that ſtave in the general claviary or ſyſtem, and to point out the names of all the notes which it contains in the line of that clef.

Anciently the letters by which the notes of the gamut were ſignified were called *clefs*. Thus the letter A was the clef of the note *la*, C the clef of *ut*, E the clef of *mi*, &c. In proportion as the ſyſtem was extended, the embarraſſment and ſuperfluity of this multitude of clefs were felt.

Gui d'Arezzo, who had invented them, marked a letter or clef at the beginning of each line in the ſtave; for as yet he had placed no notes in the ſpaces. In proceſs of time they marked no more than one of the ſeven clefs at the beginning of one of the lines only; and this was ſufficient to fix the poſition of all the reſt, according to their natural order: at laſt, of theſe ſeven lines or clefs they ſelected four, which were called *claves ſignatæ*, or *diſcriminating clefs*, becauſe they ſatisfied themſelves with marking one of them upon one of the lines, from which the powers of all the others might be recognized. Preſently afterwards they even retrenched one of theſe four, viz. the gamma, of which they made uſe to mark the *ſol* below, that is to ſay, the hypoproſlambanomene added to the ſyſtem of the Greeks.

In reality Kircher aſſerts, that if we underſtood the characters in which ancient muſic was written, and examined minutely the forms of our clefs, we ſhould find that each of them repreſents the letter a little altered in its form, by which the note was originally named. Thus the clef of *ſol* was originally a G, the clef of *ut* a C, and the clef of *Fa* an F.

We have then three clefs, one a fifth above the other: the clef of F, or *fa*, which is the loweſt; the clef of *ut*, or C, which is the fifth above the former; and the clef of *ſol*, or G, which is a fifth above that of *ut*. Theſe clefs, both as marked by foreigners and in Britain, may be ſeen in art. 170 of MUSIC; upon which it is neceſſary to remark, that by a remain of ancient practice, the clef is always placed upon a line, and never in a ſpace. It deſerves notice, that the clef of *fa* is marked in three different manners: one in muſic which is printed; another in muſic which is written or engraved; and a third in the full harmony of the chorus.

Plate CXLIV. fig. 9. Vol. V.

By adding four lines above the clef of *ſol*, and three lines beneath the clef of *fa*, which gives both above and below the greateſt extent of permanent or eſtabliſhed lines, it appears, that the whole ſcale of notes which can be placed upon the gradations relative to theſe clefs amounts to 24; that is to ſay, three octaves and a fourth from the F, or *fa*, which is found beneath the firſt line, to the *ſi*, or B, which is found above the laſt, and all this together forms what we call the *general claviary;* from whence we may judge, that this compaſs has, for a long time, conſtituted the extent of the ſyſtem. But as at preſent it is continually acquiring new degrees, as well above as below, the degrees are marked by larger lines, which are added above or below as occaſion requires.

Inſtead of joining all the lines, as has been done by Rouſſeau in his Dictionary, (plate A, fig. 5.) to mark the relation which one clef bears to another, they ſeparate them five by five; becauſe it is pretty nearly within the degrees to which the compaſs of ordinary voices extends. This collection of five lines is called a *ſtave;* and in theſe they place a clef, to determine the names of the notes, the poſitions of ſemitones, and to ſhow what ſtation the ſtave occupies in the claviary or general ſcale.

In whatever manner we take five ſucceſſive lines in the claviary, we ſhall find one clef comprehended; nay, ſometimes two, in which caſe one may be retrenched as uſeleſs. Cuſtom has even preſcribed which of the two ſhould be retrenched, and which retained; it is this likewiſe which has determined the number of poſitions aſſigned to each clef.

If I form a ſtave of the firſt five lines in the claviary, beginning from below, I find the clef of *fa* in the fourth line. This then is one poſition of the clef, and this poſition evidently relates to the loweſt note; thus likewiſe it is that of the baſe clef.

If I wiſh to gain a third in aſcent, I muſt add a line above; I muſt then obliterate one below, otherwiſe the ſtave will contain more than five lines. The clef of *fa* then is found transferred from the fourth to the third, and the clef of *ut* is likewiſe found upon the fifth; but as two clefs are uſeleſs, they retrench here that of *ut*. It is evident, that the ſtave of this clef is a third higher than the former.

By throwing away ſtill one line below to gain another above, we have a third kind of a ſtave, where the clef of *fa* will be found upon the ſecond line, and that of *ut* upon the fourth. Here we leave out the clef of *fa*, and retain that of *ut*. We have now gained another third above, and loſt it below.

By continuing theſe alterations from line to line, we paſs ſucceſſively through four different poſitions of the clef of *ut*. Having arrived at that of *ſol*, we find it placed upon the ſecond line, and then upon the firſt. This poſition includes the five higheſt lines, and gives the ſharpeſt diapaſon which the clefs can ſignify.

The reader may ſee in Rouſſeau's Muſical Dictionary, Plate A. fig. 5. this ſucceſſion of clefs from the loweſt to the higheſt; which in all conſtitutes eight ſtaves, clefs, or different poſitions of clefs.

Whatever might be the character and genius of any voice or inſtrument, if its extent above or below does not ſurpaſs that of the general claviary, in this number may be found a ſtation and a clef ſuitable to it; and there are, in reality, clefs determined for all the parts in muſic. If the extent of a part is very conſiderable, ſo that the number of lines neceſſary to be added above or below may become inconvenient, the clef is then changed in the courſe of the muſic. It may be plainly perceived by the figure, what clef it is neceſſary to chooſe, for raiſing or depreſſing any part, under whatever clef it may be actually placed.

It will likewiſe appear, that, in order to adjuſt one clef to another, both muſt be compared by the general claviary, by means of which we may determine what every note under one of the clefs is with reſpect to the other. It is by this exerciſe repeated that we acquire the habit of reading with eaſe all the parts.

From this manœuvre it follows, that we may place whatever note we pleaſe of the gamut upon any line or ſpace whatever of the ſtave, ſince we have the choice of eight different poſitions, which is equal to the number of notes in the octave. Thus you may mark a whole tune upon the ſame line, by changing the clef at each gradation. The 7th fig. of the ſame plate in Rouſſeau's Muſical Dictionary, to which we formerly referred, ſhows by the ſeries of clefs the order of the notes, *re, fa, la, ut, mi, ſol, ſi, re,* riſing by thirds, although all placed upon the ſame line. The fig. following repreſents upon the order of the ſame clefs the note *ut*, which appears to deſcend by thirds upon all the lines of the ſtave; and further, which yet, by means of changing the clef, ſtill preſerves its uniſon. It is upon ſuch examples as this, that ſcholars ought to exerciſe themſelves, in order to underſtand at the firſt glance the powers of all the clefs, and their ſimultaneous effect.

There are two of their poſitions, viz. the clef of *ſol* upon the firſt line, and that of *fa* upon the third, which ſeem daily to fall more and more into deſuetude. The firſt of theſe may ſeem leſs neceſſary, becauſe it produces nothing but a poſition entirely ſimilar to that of *fa* upon the fourth line, from which however it differs by two octaves. As to the clef of *fa*, it is plain, that in removing it entirely from the third line, we ſhall no longer have any equivalent poſition, and that the compoſition of the claviary, which is at preſent complete, will by theſe means become defective.

Thus much for Rouſſeau's account of clefs. He proceeds to explain their tranſpoſition; but as this would render the preſent article too long and intricate, we refer the curious to his *Muſical Dictionary*, vol. i. page 162. See alſo *Malcom's Diſſertation on Muſic.*

CLEFT, in a general ſenſe, is a ſpace made by the ſeparation of parts. Green timber is very apt to ſplit and cleave in ſeveral places, after it is wrought into form; and theſe cracks in it are very diſagreeable to the ſight. The common method of the country carpenters is to fill up theſe cracks with a mixture of greaſe and ſaw duſt; but the neateſt way of all is, the ſoaking both ſides well with the fat of beef broth, and then dipping pieces of ſpunge into the ſame broth, and filling up all the cracks with them: they ſwell out ſo as to fill the whole crack; and accommodate themſelves ſo well to it, that the deficiency is hardly ſeen.

CLEFTS, or *Cracks*, in farriery, appear on the bought of the paſterns, and are cauſed by a ſharp and malignant humour. See FARRIERY *Index*.

CLEMA, in antiquity, a twig of the vine, which ſerves as a badge of the centurion's office.

CLEMATIS, VIRGIN'S-BOWER. See BOTANY *Index*.

CLEMENCY, denotes much the ſame with mercy, and implies a remiſſion of ſeverity towards offenders. The term is moſt generally uſed in ſpeaking of the forgiveneſs exerciſed by princes or perſons of high authority. It is the reſult, indeed, of a diſpoſition which ought to be cultivated by all ranks, though its effects cannot be equally conſpicuous or extenſive. In praiſe of clemency joined with power, it is obſerved, that it is not only the privilege, the honour, and the duty of a prince, but it is alſo his ſecurity, and better than all his garriſons, forts, and guards, to preſerve himſelf and his dominions in ſafety: That that prince is truly royal, who maſters himſelf; looks upon all injuries as below him; and governs by equity and reaſon, not by paſſion or caprice. In illuſtration of this ſubject, the following examples are ſelected out of many recorded in hiſtory.

Sueton. c. 9. 1. Two patricians having conſpired againſt Titus the Roman emperor, were diſcovered, convicted, and ſentenced to death by the ſenate; but the good-natured prince ſent for them, and in private admoniſhed them, that in vain they aſpired to the empire, which was given by deſtiny; exhorting them to be ſatisfied with the rank in which by Providence they had been placed, and offering them any thing elſe which was in his power to grant. At the ſame time he diſpatched a meſſenger to the mother of one of them, who was then at a great diſtance, and under deep concern about the fate of her ſon, to aſſure her, that her ſon was not only alive, but forgiven.

Zoſ. ii 674. 2. Licinius having raiſed a numerous army, Zoſimus ſays 130,000 men, endeavoured to wreſt the government out of the hands of his brother-in-law Conſtantine the emperor. But his army being defeated, Licinius fled with what forces he could rally to Nicomedia, whither Conſtantine purſued him, and immediately inveſted the place; but on the ſecond day of the ſiege, the emperor's ſiſter intreating him, with a flood of tears, by the tenderneſs he had ever ſhown for her, to forgive her huſband, and grant him at leaſt his life, he was prevailed upon to comply with her requeſt; and the next day, Licinius, finding no means of making his eſcape, preſented himſelf before the conqueror, and throwing himſelf at his feet, yielded to him the purple and the other enſigns of ſovereignty. Conſtantine received him in a very friendly manner, entertained him at his table, and afterwards ſent him to Theſſalonica, aſſuring him, that he ſhould live unmoleſted ſo long as he raiſed no new diſturbances.

3. The council of thirty, eſtabliſhed at Athens by Lyſander, committed the moſt execrable cruelties. Upon pretence of reſtraining the multitude within their duty, and to prevent ſeditions, they had cauſed guards to be aſſigned them, had armed 3000 of the citizens for that purpoſe, and at the ſame time diſarmed all the reſt. The whole city was in the utmoſt terror and diſmay. Whoever oppoſed their injuſtice and violence fell a victim to their reſentment. Riches were a crime that never failed of drawing a ſentence upon their owners, always followed with death and the confiſcation of eſtates; which the thirty tyrants divided amongſt themſelves. They put more people to death (ſays Xenophon) in eight months of a peace, than their enemies had done in a war of thirty years. All the citizens of any conſideration in Athens, and who retained a love of liberty, quitted a place reduced to ſo hard and ſhameful a ſlavery, and ſought elſewhere an aſylum and retreat where they might live in ſafety. At the head of theſe was Thraſybulus, a perſon of extraordinary merit, who beheld with the moſt lively affliction the miſeries of his country.

The Lacedemonians had the inhumanity to endeavour to deprive thoſe unhappy fugitives of this laſt reſource. They publiſhed an edict to prohibit the cities of Greece from giving them refuge, decreed that they ſhould be delivered up to the thirty tyrants, and condemned all ſuch as ſhould contravene the execution of this edict to pay a fine of five talents. Only two cities rejected with diſdain ſo unjuſt an ordinance, Megara and Thebes; the latter of which made a decree to puniſh all perſons whatſoever that ſhould ſee an Athenian attacked by his enemies without doing his utmoſt to aſſiſt him. Lyſias, an orator of Syracuſe who had been baniſhed by the thirty, raiſed 500 ſoldiers at his own expence, and ſent them to the aid of the common country of Eloquence. Thraſybulus loſt no time. After having taken Phyta, a ſmall fort in Attica, he marched to the Piræus, of which he made himſelf maſter. The thirty flew thither with their troops, and a battle enſued. The tyrants were overthrown. Critias, the moſt ſavage of them all, was killed on the ſpot: and as the army was taking to flight, Thraſybulus cried out, "Wherefore do you fly from me as from a victor, rather than aſſiſt me as the avenger of your liberty? We are not enemies, but fellow-citizens, nor have we declared war againſt the city, but againſt the thirty tyrants." He continued to remind them, that they had the ſame origin, country, laws, and religion: he exhorted them to compaſſionate their exiled brethren, to reſtore their country to them, and reſume their own liberty. This diſcourſe had the deſired effect. The army, upon their return to Athens, expelled the thirty, and ſubſtituted ten perſons to govern in their room, whoſe conduct proved no better than theirs; but King Pauſanias, moved with compaſſion for the deplorable condition to which a city, once ſo flouriſhing, was redeced, had the generoſity to favour the Athenians in ſecret, and at length obtained a peace for them. It was ſealed with the blood of the tyrants, who having taken arms to reinſtate themſelves in the government, were all put to the ſword, and left Athens in the full poſſeſſion of its liberty. All the exiles were recalled. Thraſybulus at that time propoſed the celebrated amneſty, by which the citizens engaged upon oath, that all paſt tranſactions ſhould be buried in oblivion. The government was re-eſtabliſhed upon its ancient footing, the laws were reſtored to their priſtine vigour, and magiſtrates elected with the uſual form.

This (ſays Rollin) is one of the fineſt events in ancient hiſtory, worthy the Athenian clemency and benevolence, and has ſerved as a model to ſucceeding ages in all good governments. Never had tyranny been more cruel and bloody than that which the Athenians had lately thrown off. Every houſe was in mourning, every family bewailed the loſs of ſome relation: it had been a ſeries of public robbery and rapine, in which licenſe and impunity had authorized all manner of crimes. The people ſeemed to have a right to demand the blood of all accomplices in ſuch notorious malverſations, Clemency. ſations, and even the intereſt of the ſtate to authorize ſuch a claim, that by the exemplary ſeverities ſuch enormous crimes might be prevented for the future. But Thraſybulus riſing above theſe ſentiments, from the ſuperiority of his more extenſive genius, and the views of a more diſcerning and profound policy, foreſaw, that by giving into the puniſhment of the guilty, eternal ſeeds of diſcord and enmity would remain, to weaken the public by domeſtic diviſions, when it was neceſſary to unite againſt the common enemy, and alſo occaſion the loſs to the ſtate of a great number of citizens, who might render it important ſervices from the view of making amends for paſt miſbehaviour.

4. Such conduct, after great troubles in a ſtate, has always appeared to the ableſt politicians, the moſt certain and ready means to reſtore the public peace and tranquillity. Cicero, when Rome was divided into two factions upon the occaſion of Cæſar's death, who had been killed by the conſpirators, calling to mind this celebrated amneſty, propoſed, after the example of the Athenians, to bury all that had paſſed in eternal oblivion.

5. Cardinal Mazarine obſerved to Don Lewis de Haro, prime miniſter of Spain, that this gentle and humane conduct in France had prevented the troubles and revolts of that kingdom from having any fatal conſequences, and "that the king had not loſt a foot of land by them to that day;" whereas "the inflexible ſeverity of the Spaniards was the occaſion that the ſubjects of that monarchy, whenever they throw off the maſk, never returned to their obedience but by the force of arms; which ſufficiently appears (ſays he) in the example of the Hollanders, who are in the peaceable poſſeſſion of ſo many provinces, that not an age ago were the patrimony of the king of Spain."

rod. ix. 77, 78. 6. Leonidas the Lacedæmonian having, with 300 men only, diſputed the paſs of Thermopylæ againſt the whole army of Xerxes, and being killed in that engagement, Xerxes, by the advice of Mardonius one of his generals, cauſed his dead body to be hung upon a gallows, making thereby the intended diſhonour of his enemy his own immortal ſhame. But ſome time after, Xerxes being defeated, and Mardonius ſlain, one of the principal citizens of Ægina came and addreſſed himſelf to Pauſanias, deſiring him to avenge the indignity that Mardonius and Xerxes had ſhown to Leonidas, by treating Mardonius's body after the ſame manner. As a farther motive for doing ſo, he added, that by thus ſatisfying the manes of thoſe who were killed at Thermopylæ, he would be ſure to immortalize his own name throughout all Greece, and make his memory precious to the lateſt poſterity. "Carry thy baſe counſels elſewhere (replied Pauſanias); thou muſt have a very wrong notion of true glory to imagine, that the way for me to acquire it is to reſemble the barbarians. If the eſteem of the people of Ægina is not to be purchaſed but by ſuch a proceeding, I ſhall be content with preſerving that of the Lacedæmonians only, amongſt whom the baſe and ungenerous pleaſure of revenge is never put in competition with that of ſhowing clemency and moderation to their enemies, eſpecially after their death. As for the ſouls of my departed countrymen, they are ſufficiently avenged by the death of the many thouſand Perſians ſlain upon the ſpot in the laſt engagement."

Clemens, Clement. CLEMENS ROMANUS, biſhop of Rome, where he is ſaid to have been born; and to have been fellow-labourer with St Peter and St Paul. We have nothing remaining of his works that is clearly genuine, excepting one epiſtle, written to quiet ſome diſturbances in the church of Corinth; which, next to holy writ, is eſteemed one of the moſt valuable remains of eccleſiaſtical antiquity.

CLEMENS *Alexandrinus*, ſo called to diſtinguiſh him from the former, was an eminent father of the church, who flouriſhed at the end of the ſecond and beginning of the third centuries. He was the ſcholar of Pantænus, and the inſtructor of Origen. The beſt edition of his works is that in 2 vols folio, publiſhed in 1715, by Archbiſhop Potter.

CLEMENT V. Pope, the firſt who made a public ſale of indulgences. He tranſplanted the holy ſee to Avignon in France; greatly contributed to the ſuppreſſion of the knights templars; and was author of a compilation of the decrees of the general councils of Vienne ſtyled *Clementines*. He died in 1314.

CLEMENT VII. *Julius de Medicis*, Pope, memorable for his refuſing to divorce Catharine of Arragon from Henry VIII.; and for the bull he publiſhed upon the king's marriage with Anne Boleyn, which, according to the Romiſh authors, loſt him England. He died in 1534.

CLEMENT XIV. *Francis Laurentius Ganganelli*, Pope, was born at St Angelo, in the duchy of Urbino, in October 1705; and choſen pope, though not yet a biſhop, in 1769: at which time the ſee of Rome was involved in a moſt diſagreeable and dangerous conteſt with the houſe of Bourbon. His reign was rendered troubleſome by the colliſion of parties on the affairs of the Jeſuits; and it is pretended that his latter days were embittered by the apprehenſions of poiſon. Though this report was probably apocryphal, it is ſaid that he often complained of the heavy burden which he was obliged to bear; and regretted, with great ſenſibility, the loſs of that tranquillity which he enjoyed in his retirement when only a ſimple Franciſcan. He was, however, fortunate in having an opportunity, by a ſingle act, to diſtinguiſh a ſhort adminiſtration of five years in ſuch a manner as will ever prevent its ſinking into obſcurity. His death was immediately attributed to poiſon, as if an old man of 70, loaded with infirmities and diſorders, could not quit the world without violence. His proceedings againſt the Jeſuits furniſhed a plauſible pretence for this charge, and the malevolence of their enemies embelliſhed it with circumſtances. It even ſeems as if the miniſters of thoſe powers who had procured their diſſolution did not think it beneath them to countenance the report; as if falſehood was neceſſary to prevent the revival of a body which had already ſunk, in its full ſtrength, under the weight of real miſconduct. The charge was the more ridiculous, as the pontiff had undergone a long and painful illneſs, which originally proceeded from a ſuppreſſion of urine, to which he was ſubject; yet the report was propagated with the greateſt induſtry; and though the French and Spaniſh miniſters were preſent at the opening of his body, the moſt horrible circumſtances were publiſhed relative to that operation. It was confidently told that the head fell off from the body, and that the ſtench poiſoned and killed the operators. It availed but little that the operators ſhowed themſelves alive and in good health, and that the ſurgeons and phyſicians proved the falſehood of every part of the report. Clement XIV. appears to have been a man of a virtuous character, and poſſeſſed of conſiderable abilities. He died much regretted by his ſubjects.

CLEMENTINE, a term uſed among the Auguſtins, who apply it to a perſon who, after having been nine years a ſuperior, ceaſes to be ſo, and becomes a private monk, under the command of a ſuperior. The word has its riſe hence, that Pope Clement, by a bull, prohibited any ſuperior among the Auguſtins from continuing above nine years in his office.

CLEMENTINES, in the canon law, are the conſtitutions of Pope Clement V. and the canons of the council of Vienne.

CLENARD, *Nicholas*, a celebrated grammarian in the 16th century, was born at Dieſt; and after having taught humanity at Louvain, travelled into France, Spain, Portugal, and Africa. He wrote in Latin, 1. Letters relating to his Travels, which are very curious and ſcarce. 2. A Greek Grammar, which has been reviſed and corrected by many grammarians; and other works. He died at Grenoble in 1542.

CLEOBIS and BITON, two youths, ſons of Cydippe the prieſteſs of Juno at Argos. When oxen could not be procured to draw their mother's chariot to the temple of Juno, they put themſelves under the yoke, and drew it 45 ſtadia to the temple, amidſt the acclamations of the multitude, who congratulated the mother on account of the piety of her ſons. Cydippe intreated the goddeſs to reward the piety of her ſons with the beſt gift that could be granted to a mortal. They went to reſt and awoke no more; and by this the goddeſs ſhowed that death is the only true happy event that can happen to a man. The Argives raiſed them ſtatues at Delphi.

CLEOBULUS, ſon of Evagoras, and one of the Grecian ſages; he was valiant, a lover of learning, and an enemy to vice. Flouriſhed about 560 years before Chriſt.

CLEOMBROTUS, a king of Sparta, ſon of Anaxandrides. He was deterred from building a wall acroſs the iſthmus of Corinth againſt the approach of the Perſians, by an eclipſe of the ſun. He died in the 75th Olympiad, and was ſucceeded by Pliſtarchus, ſon of Leonidas, a minor.

CLEOMBROTUS II. ſon of Pauſanias king of Sparta, after his brother Ageſipolis I. He made war againſt the Bœotians, and leſt he ſhould be ſuſpected of treacherous communications with Epaminondas, he gave that general battle at Leuctra, in a very diſadvantageous place. He was killed in the engagement, and his army deſtroyed, in the year of Rome 382.

CLEOMBROTUS III. a ſon-in-law of Leonidas king of Sparta, who for a while uſurped the kingdom after the expulſion of his father-in-law. When Leonidas was recalled, Cleombrotus was baniſhed, and his wife Chelonis, who had accompanied her father, now accompanied her huſband in his exile.

CLEOME, in *Botany*: A genus of the ſiliquoſa order, belonging to the tetradynamia claſs of plants; and in the natural method ranking under the 25th order, *Putamineæ*. There are three nectariferous glandules, one at each ſinus of the calyx except the loweſt; the petals all riſing upwards; the ſiliqua unilocular and bivalved. There are 15 ſpecies, all of them, except two, natives of warm climates. They are herbaceous plants, riſing from one to two feet high; and are adorned with flowers of various colours, as red, yellow, fleſh-colour, &c. They are propagated by ſeeds, and require no other care than what is common to other exotics which are natives of warm countries.

CLEOMENES, king of Sparta, conquered the Argives, and freed Athens from the tyranny of the Piſiſtratidæ. By bribing the oracle he pronounced Demaratus, his colleague on the throne, illegitimate, becauſe he refuſed to puniſh the people of Ægina, who had deſerted the Greeks. He killed himſelf in a fit of madneſs.

CLEOMENES II. ſucceeded his brother Ageſipolis II. He reigned 34 years in the greateſt tranquillity, and was father to Acrotatus and Cleonymus. He was ſucceeded by Areus I. ſon of Acrotatus.

CLEOMENES III. ſucceeded his father Leonidas. He was of an enterpriſing ſpirit, and reſolved to reſtore the ancient diſcipline of Lycurgus in its full force. He killed the Ephori, and removed by poiſon his royal colleague Eurydamides, and made his own brother Euclidas king, againſt the laws of the ſtate, which forbade more than one of the ſame family to ſit on the throne. He made war againſt the Achæans, and attempted to deſtroy the Achæan league. Aratus the general of the Achæans, who ſuppoſed himſelf inferior to his enemy, called Antigonus to his aſſiſtance; and Cleomenes, when he had fought the unfortunate battle of Sellaſia, retired into Egypt to the court of Ptolemy Euergetes, where his wife and children had gone before him. Ptolemy received him with great cordiality; but his ſucceſſor, weak and ſuſpicious, ſoon expreſſed his jealouſy of this noble ſtranger, and impriſoned him. Cleomenes killed himſelf, and his body was flayed and expoſed on a croſs, 140 Olymp.

CLEON, the name of ſeveral noted men of antiquity. 1. Of an Athenian, who, though originally a tanner, became general of the armies of the ſtate by his intrigues and eloquence. He took Thoron in Thrace, and was killed at Amphipolis in a battle with Braſidas the Spartan general, Olymp. 89th. 2. A general of Meſſenia, who diſputed with Ariſtodemus for the ſovereignty. 3. A ſtatuary. 4. A poet who wrote a poem on the Argonauts. 5. An orator of Halicarnaſſus who compoſed an oration for Lyſander, in which he intimated the propriety of making the kingdom of Sparta elective. 6. A Magneſian who wrote ſome commentaries, in which he ſpeaks of portentous events, &c.

CLEONÆ, in *Ancient Geography*, a town of Argolis, above Mycenæ, on the road which leads from Argos to Corinth; ſtanding on an eminence, on every ſide occupied by houſes. In the foreſt near this town was ſlain by Hercules the huge lion (Sil. Italicus, Seneca). *Cleonæus* the epithet. *Cleonæum Sidus*, the lion.——Another *Cleonæ* on Mount Athos in Chalcidice.

CLEOPATRA, the celebrated queen of Egypt, was daughter of Ptolemy Auletes. By her extraordinary beauty, ſhe ſubdued the two renowned Roman generals Julius Cæſar and Mark Antony; the latter of whom, it is thought, loſt the empire of Rome by his attachment to her. At length Mark Antony being ſubdued by Octavius Cæſar, ſhe tried the force of her declining charms upon the conqueror, but in vain; upon which, expecting no mercy from him, ſhe poiſoned herſelf, 30 years before Chriſt. According to ſome authors, ſhe was the reſtorer of the Alexandrian library, to which ſhe added that of Pergamos; and it is ſaid, that ſhe ſtudied philoſophy to conſole her for the abſence of Antony. With her death ended the family of the Ptolemies in Egypt, after it had reigned from the death of Alexander 294 years: for Egypt, after this, was reduced to a Roman province, in which dependence it remained till it was taken from them by the Saracens, A. D. 641.

CLEOPATRIS, in *Ancient Geography*, a town of Egypt, on the Arabian gulf. See ARSINOE. Now ſaid to be *Suez*, ſituated at the bottom of the gulf of the Red Sea. E. Long. 34. 30. N. Lat. 30. 0.

CLEOSTRATUS, a celebrated aſtronomer born in Tenedos, was, according to Pliny, the firſt who diſcovered the ſigns of the zodiac; others ſay, that he only diſcovered the ſigns Aries and Sagittarius. He alſo corrected the errors of the Grecian year about the 306th year before Chriſt.

CLEPSYDRA, an inſtrument or machine ſerving to meaſure time by the fall of a certain quantity of water.

The word comes from κλεπτω, *condo*, and υδωρ, *aqua*, "water;" though there have likewiſe been clepſydræ made with mercury.

The Egyptians, by this machine, meaſured the courſe of the ſun. Tycho Brahe, in our days, made uſe of it to meaſure the motion of the ſtars, &c. and Dudley uſed the ſame contrivance in making all his maritime obſervations. The uſe of clepſydræ is very ancient; they were invented in Egypt under the Ptolemies, as were alſo ſun-dials. Their uſe was chiefly in the winter; the ſun-dials ſerved in the ſummer. They had two great defects; the one, that the water ran out with a greater or leſs facility, as the air was more or leſs denſe; the other, that the water ran more readily at the beginning than towards the concluſion. M. Amontons has invented a clepſydra free from both theſe inconveniences: and which has theſe three grand advantages, of ſerving the ordinary purpoſe of clocks, of ſerving in navigation for the diſcovery of the longitude, and of meaſuring the motion of the arteries.

Conſtruction of a CLEPSYDRA. To divide any cylindric veſſel into parts to be emptied in each diviſion of time; the time wherein the whole, and that wherein any part, is to be evacuated, being given.

Suppoſe, for example, a cylindric veſſel, whoſe charge of water flows out in 12 hours, were required to be divided into parts to be evacuated each hour. 1. As the part of time 1 is to the whole time 12; ſo is the ſame time 12 to a fourth proportional, 144. 2. Divide the altitude of the veſſel into 144 equal parts: here the laſt will fall to the laſt hour; the three next above to the laſt part but one; the five next to the tenth hour, &c.; laſtly, the 23 laſt to the firſt hour. For ſince the times increaſe in the ſeries of the natural numbers 1, 2, 3, 4, 5, &c. and the altitudes, if the numeration be in retrograde order from the twelfth hour, increaſe in the ſeries of the unequal numbers 1, 3, 5, 7, 9, &c. the altitude, computed from the twelfth hour, will be as the ſquares of the times, 1, 4, 9, 16, 25, &c. therefore the ſquare of the whole time 144 comprehends all the parts of the altitude of the veſſel to be evacuated. But a third proportional to 1 and 12 is the ſquare of 12, and conſequently it is the number of equal parts into which the altitude is to be divided, to be diſtributed according to the ſeries of the unequal numbers, through the equal intervals of hours. Since in lieu of parts of the ſame veſſel, other leſs veſſels equal thereto may be ſubſtituted, the altitude of a veſſel emptied in a given ſpace of time being given, the altitude of another veſſel to be emptied in a given time may be found; viz. by making the altitudes as the ſquares of the time. For a further deſcription, with a figure, ſee HYDROSTATICS.

CLERC, JOHN LE, a moſt celebrated writer and univerſal ſcholar, born at Geneva in 1657. After he had paſſed through the uſual courſe of ſtudy at Geneva, and had loſt his father in 1676, he went to France in 1678; but returning the year after, he was ordained with the general applauſe of all his examiners. In 1682, Le Clerc viſited England with a view to learning the language. He preached ſeveral times in the French churches in London, and viſited ſeveral biſhops and men of learning; but the ſmoky air of the town not agreeing with his lungs, he returned to Holland within the year, where he at length ſettled. He preached before a ſynod held at Rotterdam by the remonſtrants in 1684; and was admitted profeſſor of philoſophy, polite literature, and the Hebrew tongue, in their ſchool at Amſterdam. The remainder of his life affords nothing but the hiſtory of his works, and of the controverſies he was engaged in; but theſe would lead into too extenſive a detail. He continued to read regular lectures; and becauſe there was no ſingle author full enough for his purpoſe, he drew up and publiſhed his Logic, Ontology, Pneumatology, and Natural Philoſophy. He publiſhed *Ars Critica;* a Commentary on the Old Teſtament; a Compendium of Univerſal Hiſtory; an Eccleſiaſtical Hiſtory of the two firſt Centuries; a French Tranſlation of the New Teſtament, &c. In 1686, he began, jointly with M. de de Croſe, his *Bibliotheque Univerſelle et Hiſtorique*, in imitation of other literary journals; which was continued to the year 1693 incluſive, in 26 vols. In 1703, he began his *Bibliotheque Choiſie*, and continued it to 1714, and then commenced another work on the ſame plan called *Bibliotheque Ancienne et Moderne*, which he continued to the year 1728; all of them juſtly deemed excellent ſtores of uſeful knowledge. In 1728 he was ſeized with a palſy and fever; and after ſpending the laſt ſix years of his life with little or no underſtanding, died in 1736.

CLERC, *John le*, called *Chevalier*, an eminent hiſtorical painter, was born at Nanci in 1587, but ſtudied in Italy, where he reſided for 20 years; and was a diſciple of Carlo Venetiano, with whom he worked a long time, and whoſe ſtyle he ſo effectually ſtudied and imitated, that ſeveral of the pictures which were finiſhed by Le Clerc were taken for the work of Venetiano. He was moſt highly eſteemed at Venice for his extraordinary merit; and as a token of public reſpect, he was made a knight of St Mark. His freedom of hand was remarkable; he had a light pencil;

and in his colouring he reſembled his maſter. He died in 1633.

Clerc, *Sebaſtian le*, engraver, and deſigner in ordinary to the French king, was born at Metz in 1637. After having learnt deſigning, he applied himſelf to mathematics, and was engineer to the marſhal de la Ferté. He went to Paris in 1665, where he applied himſelf to deſigning and engraving with ſuch ſucceſs, that M. Colbert gave him a penſion of 600 crowns. In 1672 he was admitted into the royal academy of painting and ſculpture; and in 1680 was made profeſſor of geometry and perſpective in the ſame academy. He publiſhed, beſides a great number of deſigns and prints, 1. A Treatiſe on theoretical and practical Geometry. 2. A Treatiſe on Architecture; and other works: and died in 1714.—He was an excellent artiſt, but chiefly in the petit ſtyle. His genius ſeldom exceeds the dimenſions of ſix inches. Within thoſe limits he could draw up 20,000 men with great dexterity. No artiſt except Callot and Della Bella could touch a ſmall figure with ſo much ſpirit. His moſt eſteemed prints are: 1. The *paſſion of our Saviour*, on 36 ſmall plates, lengthwiſe, from his own compoſitions. The beſt impreſſions are without the borders. 2. The *miracle of the feeding five thouſand*, a middling-ſized plate, lengthwiſe. In the firſt impreſſions, which are very rare, a town appears in the back-ground; in place of which a mountain is ſubſtituted in the common ones. 3. The *elevation of the large ſtones uſed in building the front of the Louvre*, a large plate, lengthwiſe. The firſt impreſſions are without the date 1677, which was afterwards added. 4. The *academy of the ſciences*, a middling-ſized plate, lengthwiſe. The firſt impreſſions are before the ſkeleton of the ſtag and tortoiſe were added. The ſecond impreſſions are before the ſhadow was enlarged at the bottom, towards the right-hand ſide of the print. Both theſe impreſſions are very ſcarce. The firſt is rarely met with. This print was copied for Chambers's Dictionary. 5. The *May of the Gobelins*, a middle-ſized plate, lengthwiſe. The firſt impreſſion is before the woman was introduced, who covers the wheel of the coach. 6. The *four conqueſts*, large plates, lengthwiſe, repreſenting the taking of Tournay, the taking of Douay, the defeat of the comte de Marſin, and the Switzerland alliance. 7. The *battles of Alexander*, from Le Brun, ſix ſmall long plates, including the title, which repreſents the picture gallery at the Gobelins. The firſt impreſſions of the tent of Darius, which plate makes part of this ſet, is diſtinguiſhed by the ſhoulder of the woman, who is ſeated in the front, being without the ſhadow, which was afterwards added; for which reaſon they are called the *prints with the naked ſhoulder*. 8. The *entry of Alexander into Babylon*, a middling-ſized plate, lengthwiſe. In the firſt impreſſions, the face of Alexander is ſeen in profile; in the ſecond, it is a three-quarter face, and therefore called *the print with the head turned*.

Clerc, *George le*. See Buffon.

CLERGY, a general name given to the body of eccleſiaſtics of the Chriſtian church, in contradiſtinction to the laity. See Laity.

The diſtinction of Chriſtians into clergy and laity was derived from the Jewiſh church, and adopted into the Chriſtian by the apoſtles themſelves: whenever any number of converts was made, as ſoon as they were capable of being formed into a congregation or church, a biſhop or preſbyter, with a deacon, were ordained to miniſter to them. Of the biſhops, prieſts, and deacons, the clergy originally conſiſted; but in the third century, many inferior orders were appointed, as ſubſervient to the office of deacon, ſuch as Acoluthists, Readers, &c.

Blackſt. Comment.

This venerable body of men being ſeparated and ſet apart from the reſt of the people, in order to attend the more cloſely to the ſervice of Almighty God, have therefore large privileges allowed them by our municipal laws; and had formerly much greater, which were abridged at the time of the reformation, on account of the ill uſe which the Popiſh clergy had endeavoured to make of them. For, the laws having exempted them from almoſt every perſonal duty, they attempted a total exemption from every ſecular tie. But it is obſerved by Sir Edward Coke, that as the overflowing of waters doth many times make the river to loſe its proper channel, ſo, in times paſt, eccleſiaſtical perſons, ſeeking to extend their liberties beyond their due bounds, either loſt, or enjoyed not, thoſe which of right belonged to them. The perſonal exemptions do indeed for the moſt part continue: a clergyman cannot be compelled to ſerve on a jury, nor to appear at a court-leet, or view of frank-pledge, which almoſt every other perſon is obliged to do; but if a layman is ſummoned on a jury, and before the trial takes orders, he ſhall notwithſtanding appear and be ſworn. Neither can he be choſen to any temporal office, as bailiff, reeve, conſtable, or the like; in regard of his own continual attendance on the ſacred function. During his attendance on divine ſervice, he is privileged from arreſts in civil ſuits. In caſes alſo of felony, a clerk in orders ſhall have the benefit of his clergy, without being branded in the hand; and may likewiſe have it more than once; in both which particulars he is diſtinguiſhed from a layman. But, as they have their privileges, ſo alſo they have their diſabilities, on account of their ſpiritual avocations. Clergymen are incapable of ſitting in the houſe of commons; and by ſtatute 21 Hen. VIII. c. 13. are not in general allowed to take any lands or tenements to farm, upon pain of 10l. per month, and total avoidance of the leaſe; nor, upon like pain, to keep any tap-houſe or brew-houſe; nor engage in any manner of trade, nor ſell any merchandiſe, under forfeiture of treble value. Which prohibition is conſonant to the canon law.

Benefit of Clergy, is an ancient privilege whereby one in orders claimed to be delivered to his ordinary to purge himſelf of felony.

After trial and conviction* of a criminal, the judgment of the court regularly follows, unleſs ſuſpended or arreſted by ſome intervening circumſtance, of which the principal is *benefit of clergy*; a title of no ſmall curioſity as well as uſe; and concerning which, therefore, it may not be improper to inquire, 1. Into its original, and the various mutations which this privilege of the clergy has ſuſtained. 2. To what perſons it is to be allowed at this day. 3. In what caſes. 4. The conſequences of allowing it.

* See the articles A *raignment*, *Plea*, *Tri* and *Conv tion.*

Blackſt. Comment.

I. Clergy, the *privilegium clericale*, or (in common ſpeech, the benefit of clergy) had its original from the pious regard paid by Chriſtian princes to the church in its infant ſtate, and the ill uſe which the popiſh eccleſiaſtics ſoon made of that pious regard. The exemptions which they granted to the church were principally of two kinds: 1. Exemptions of places conſecrated to religious duties from criminal arreſts; which was the foundation of ſanctuaries. 2. Exemption of the perſons of clergymen from criminal proceſs before the ſecular judge in a few particular caſes; which was the true original and meaning of the *privilegium clericale*.

But the clergy increaſing in wealth, power, honour, number, and intereſt, ſoon began to ſet up for themſelves; and that which they obtained by the favour of the civil government, they now claimed as their inherent right, and as a right of the higheſt nature, indefeaſible, and *jure divino*. By their canons, therefore, and conſtitutions, they endeavoured at, and where they met with eaſy princes, obtained, a vaſt extenſion of thoſe exemptions; as well in regard to the crimes themſelves, of which the liſt became quite univerſal, as in regard to the perſons exempted; among whom were at length comprehended, not only every little ſubordinate officer belonging to the church or clergy, but even many that were totally laymen.

In England, however, although the uſurpations of the pope were very many and grievous, till Henry VIII. totally exterminated his ſupremacy, yet a total exemption of the clergy from ſecular juriſdiction could never be throroughly effected, though often endeavoured by the clergy; and therefore, though the ancient *previlegium clericale* was in ſome capital caſes, yet it was not univerſally allowed. And in thoſe particular caſes, the uſe was for the biſhop or ordinary to demand his clerks to be remitted out of the king's courts as ſoon as they were indicted; concerning the allowance of which demand there was for many years a great uncertainty; till at length it was finally ſettled in the reign of Henry VI. that the priſoner ſhould firſt be arraigned; and might either then claim his benefit of clergy by way of declinatory plea; or, after conviction, by way of arreſt of judgment. This latter way is moſt uſually practiſed, as it is more to the ſatisfaction of the court to have the crime previouſly aſcertained by confeſſion or the verdict of a jury; and alſo it is more advantageous to the priſoner himſelf, who may poſſibly be acquitted, and ſo need not the benefit of his clergy at all.

Originally the law was held that no man ſhould be admitted to the benefit of clergy, but ſuch as had the *habitum et tonſuram clericalem*. But, in proceſs of time, a much wider and more comprehenſive criterion was eſtabliſhed; every one that could read (a great mark of learning in thoſe days of ignorance and her ſiſter ſuperſtition) being accounted a clerk, or *clericus*, and allowed the benefit of clerkſhip, though neither initiated in clerkſhip, nor trimmed with the holy tonſure. But when learning, by means of the invention of printing, and other concurrent cauſes, began to be more generally diſſeminated than formerly, and reading was no longer a competent proof of clerkſhip, or being in holy orders; it was found that as many laymen as divines were admitted to the *privilegium clericale;* and therefore by ſtatute 4 Henry VII. c. 13. a diſtinction was once more drawn between mere lay ſcholars and clerks that were really in orders. And, though it was thought reaſonable ſtill to mitigate the ſeverity of the law with regard to the former, yet they were not put upon the ſame footing with actual clergy; being ſubjected to a ſlight degree of puniſhment, and not allowed to claim the clerical privilege more than once. Accordingly the ſtatute directs, that no perſon, once admitted to the benefit of clergy, ſhall be admitted thereto a ſecond time, until he produces his orders; and in order to diſtinguiſh their perſon, all laymen who are allowed this privilege, ſhall be burned with a hot iron in the brawn of the left thumb. This diſtinction between learned laymen and real clerks in orders was aboliſhed for a time by the ſtatutes 28 Hen. VIII. c. 1. and 32 Hen. VIII. c. 3.; but is held to have been virtually reſtored by ſtatute 1 Edw. VI. c. 12. which ſtatute alſo enacts, that lords of parliament and peers of the realm may have the benefit of their peerage, equivalent to that of clergy, for the firſt offence (although they cannot read, and without being burnt in the hand), for all offences then clergyable to commoners, and alſo for the crimes of houſe-breaking, highway-robbery, horſe-ſtealing, and robbing of churches.

After this burning, the laity, and before it the real clergy, were diſcharged from the ſentence of the law in the king's courts, and delivered over to the ordinary, to be dealt with according to the eccleſiaſtical canons. Whereupon the ordinary, not ſatisfied with the proofs adduced in the profane ſecular court, ſet himſelf formally to make a purgation of the offender by a new canonical trial; although he had been previouſly convicted by his country, or perhaps by his own confeſſion. This trial was held before the biſhop in perſon, or his deputy; and by a jury of twelve clerks: And there, firſt, the party himſelf was required to make oath of his own innocence; next, there was to be the oath of twelve compurgators, who ſwore they believed he ſpoke the truth; then, witneſſes were to be examined upon oath, but on behalf of the priſoner only; and, laſtly, the jury were to bring in their verdict upon oath, which uſually acquitted the priſoner; otherwiſe, if a clerk, he was degraded, or put to penance. A learned judge, in the beginning of laſt century, remarks with much indignation the vaſt complication of perjury and ſubornation of perjury in this ſolemn farce of a mock trial; the witneſſes, the compurgators, and the jury, being all of them partakers in the guilt: the delinquent party alſo, though convicted in the cleareſt manner, and conſcious of his own offence, yet was permitted, and almoſt compelled, to ſwear himſelf not guilty; nor was the good biſhop himſelf, under whoſe countenance this ſcene was tranſacted, by any means exempt from a ſhare of it. And yet, by this purgation, the party was reſtored to his credit, his liberty, his lands, and his capacity of purchaſing afreſh, and was entirely made a new and an innocent man.

This ſcandalous proſtitution of oaths, and the forms of juſtice, in the almoſt conſtant acquittal of felonious clerks by purgation, was the occaſion that, upon very heinous and notorious circumſtances of guilt, temporal courts would not truſt the ordinary with the trial of the offender, but delivered over to him the convicted clerk, *abſque purgatione faciendo*; in which ſituation the clerk convict could not make purgation; but was to continue in priſon during life, and was incapable of acquiring any perſonal property, or receiving the profits of his lands, unleſs the king ſhould pleaſe to pardon him. Both theſe courſes were in ſome degree exceptionable; the latter perhaps being too rigid, as the former was productive of the moſt abandoned perjury. As therefore theſe mock trials took their riſe from factious and popiſh tenets, tending to exempt one part of the nation from the general municipal law, it became high time, when the reformation was thoroughly eſtabliſhed, to aboliſh ſo vain and impious a ceremony.

Accordingly the ſtatute 18 Eliz. c. 7. enacts, that, for the avoiding ſuch perjuries and abuſes, after the offender has been allowed his clergy, he ſhall not be delivered to the ordinary as formerly; but, upon ſuch allowance, and burning of the hand, he ſhall forthwith be enlarged and delivered out of priſon, with proviſo, that the judge may, if he thinks fit, continue the offender in gaol for any time not exceeding a year. And thus the law continued unaltered for above a century; except only, that the ſtatute 21 Jac. I. c. 6. allowed, that women convicted of ſimple larcenies under the value of 10s. ſhould (not properly have the benefit of clergy, for they were not called upon to read; but) be burned in the hand, whipped, or ſtocked, or impriſoned for any time not exceeding a year. And a ſimilar indulgence by the ſtatutes 3 and 4 Will. and Mary, c. 9. and 4 and 5 Will. and Mary, c. 24. was extended to women guilty of any clergyable felony whatever; who were allowed once to claim the benefit of the ſtatute, in like manner as men might claim the benefit of clergy, and to be diſcharged upon being burned in the hand, and impriſoned for any time not exceeding a year. All women, all peers, and all male commoners who could read, were therefore diſcharged in ſuch felonies abſolutely, if clerks in orders; and for the firſt offence upon burning in the hand, if lay; yet all liable (except peers), if the judge ſaw occaſion, to impriſonment not exceeding a year. And theſe men who could not read, if under the degree of peerage, were hanged.

Afterwards, indeed, it was conſidered, that education and learning were no extenuations of guilt, but quite the reverſe; and that if the puniſhment of death for ſimple felony was too ſevere for thoſe who had been liberally inſtructed, it was, *à fortiori*, too ſevere for the ignorant alſo. And thereupon, by ſtatute 5 Anne, c. 6. it was enacted that the benefit of clergy ſhould be granted to all thoſe who were entitled to aſk it without requiring them to read by way of conditional merit. And, experience having ſhown that ſo univerſal a lenity was frequently inconvenient, and an encouragement to commit the lower degrees of felony; and that though capital puniſhments were too rigorous for theſe inferior offences, yet no puniſhment at all (or next to none, as branding or whipping), was as much too gentle; it was enacted by the ſame ſtatute 5 Anne, c. 6. that when any perſon is convicted of any theft or larceny, and burnt in the hand for the ſame, he ſhall, at the diſcretion of the judge, be committed to the houſe of correction or public work-houſe, to be there kept to hard labour for any time not leſs than ſix months, and not exceeding two years; with a power of inflicting a double confinement in caſe of the party's eſcape from the firſt. And it is alſo enacted by the ſtatutes 4 Geo. I. c. 11. and 6 Geo. I. c. 23. that when any perſons ſhall be convicted of any larceny, either grand or petit, or any felonious ſtealing or taking of money or goods and chattles, either from the perſon or the houſe of any other, or in any other manner, and who by the law ſhall be entitled to the benefit of clergy, and liable only to the penalties of burning in the hand, or whipping; the court in their diſcretion, inſtead of ſuch burning in the hand, or whipping, may direct ſuch offenders to be tranſported to America for ſeven years; and if they return, or are ſeen at large in this kingdom within that time, it ſhall be felony without benefit of clergy.

In this ſtate does the benefit of clergy at preſent ſtand; very conſiderably different from its original inſtitution; the wiſdom of the Engliſh legiſlature having, in the courſe of a long and laborious proceſs, extracted, by a noble alchemy, rich medicines out of poiſonous ingredients; and converted, by gradual mutations, what was at firſt an unreaſonable exemption of particular popiſh eccleſiaſtics, into a merciful mitigation of the general law with reſpect to capital puniſhments.

From the whole of this detail, we may collect, that however in times of ignorance and ſuperſtition, that monſter in true policy may for a while ſubſiſt, of a body of men reſiding in a ſtate, and yet independent of its laws; yet when learning and rational religion have a little enlightened men's minds, ſociety can no longer endure an abſurdity ſo groſs, as muſt deſtroy its very fundamentals. For, by the original contract of government, the price of protection by the united force of individuals, is that of obedience to the united will of the community. This united will is declared in the laws of the land; and that united force is exerted in their due, and univerſal, execution.

II. We are next to inquire, to what perſons the benefit of clergy is to be allowed at this day; and this muſt chiefly be collected from what has been obſerved in the preceding article. For, upon the whole, we may pronounce, that all clerks in order are, without any branding, and of courſe without any tranſportation (for that is only ſubſtituted in lieu of the other), to be admitted to this privilege, and immediately diſcharged, or at moſt only confined for one year; and this as often as they offend. Again, all lords of parliament, and peers of the realm, by the ſtatute 1 Edw. VI. c. 12. ſhall be diſcharged in all clergyable and other felonies provided for by the act without any burning in the hand, in the ſame manner as real clerks convict; but this is only for the firſt offence. Laſtly, all the commons of the realm, not in orders, whether male or female, ſhall, for the firſt offence, be diſcharged of the puniſhment of felonies, within the benefit of clergy, upon being burnt in the hand, and ſuffering diſcretionary impriſonment; or, in caſe of larceny, upon being tranſported for ſeven years, if the court ſhall think proper.

III. The third point to be conſidered is, for what crimes the *privilegium clericale*, or benefit of clergy, is to be allowed. And it is to be obſerved, that neither

ther in high treaſon, nor in petit larceny nor in any mere miſdemeanors, it was indulged at the common law; and therefore we may lay it down as a rule, that it was allowable only in petit treaſon and capital felonies; which for the moſt part became legally entitled to this indulgence by the ſtatute *de clero*, 25 Edw. III. ſtat. 3. c. 4. which provides, that clerks convict for treaſon or felonies, touching other perſons than the king himſelf or his royal majeſty, ſhall have the privilege of holy church. But yet it was not allowed in all caſes whatſoever: for in ſome it was denied even in common law, viz. *inſidatio viarum*, or lying in wait for one on the highway; *depopulatio agrorum*, or deſtroying and ravaging a country; *combuſtio domorum*, or arſon, that is, burning of houſes; all which are a kind of hoſtile acts, and in ſome degree border upon treaſon. And farther, all theſe identical crimes, together with petit treaſon, and very many other acts of felony, are ouſted of clergy by particular acts of parliament.

Upon the whole, we may obſerve the following rules. 1. That in all felonies, whether new created, or by common law, clergy is now allowable, unleſs taken away by act of parliament. 2. That where clergy is taken away from the principal, it is not of courſe taken away from the acceſſory, unleſs he be alſo particularly included in the words of the ſtatute. 3. That when the benefit of clergy is taken away from the offence (as in caſe of murder, buggery, robbery, rape, and burglary), a principal in the ſecond degree, being preſent, aiding and abetting the crime, is as well excluded from his clergy as he that is a principal in the firſt degree: but, 4. That where it is only taken away from the perſon committing the offence (as in the caſe of ſtabbing, or committing larceny in a dwelling-houſe), his aiders and abettors are not excluded, through the tenderneſs of the law, which hath determined that ſuch ſtatutes ſhall not be taken literally.

IV. Laſtly, We are to inquire what the conſequences are to the party, of allowing him this benefit of clergy. We ſpeak not of the branding, impriſonment, or tranſportation; which are rather concomitant conditions, than conſequences, of receiving this indulgence. The conſequences are ſuch as affect his preſent intereſt, and future credit and capacity; as having been once a felon, but now purged from that guilt by the privilege of clergy; which operates as a kind of ſtatute pardon. And we may obſerve, 1. That, by his conviction, he forfeits all his goods to the king; which, being once veſted in the crown, ſhall not afterwards be reſtored to the offender. 2. That, after conviction, and till he receives the judgment of the law by branding or the like, or elſe is pardoned by the king, he is, to all intents and purpoſes, a felon; and ſubject to all the diſabilities and other incidents of a felon. 3. That, after burning or pardon, he is diſcharged for ever of that, and all other felonies before committed, within the benefit of clergy; but not of felonies from which ſuch benefit is excluded; and this by ſtatutes 8 Eliz. c. 4. and 18 Eliz. c. 7. 4. That, by the burning, or pardon of it, he is reſtored to all capacities and credits, and the poſſeſſion of his lands, as if he had never been convicted. 5. That what is ſaid with regard to the advantages of commoners and laymen, ſubſequent to the burning in the hand, is equally applicable to all peers and clergymen, although never branded at all. For they have the ſame privileges, without any burning, to which others are entitled after it.

CLERK (*clericus*), a word formerly uſed to ſignify a learned man, or man of letters. The word comes from the Greek κληρος, uſed for *clergy*; but more properly ſignifying *lot* or *heritage*, in regard the lot and portion of clerks or eccleſiaſtics is to ſerve God. Accordingly *clerus* was at firſt uſed to ſignify thoſe who had a particular attachment to the ſervice of God. The origin of the expreſſion is derived from the Old Teſtament, where the tribe of Levi is called the *lot*, *heritage*, κληρος; and God is reciprocally called *their portion*; by reaſon that tribe was conſecrated to the ſervice of God, and lived on the offerings made to God, without any other ſettled proviſion as the reſt had. Thus, Paſquier obſerves, the officers of the counts (*comites*) were anciently created under the title of *clerks of accompts*; and ſecretaries of ſtate were called *clerks of the ſecret*. So *clericus domini regis*, in the time of Edward I. was Engliſhed, *the king's ſecretary*, or *clerk of his council*. The term was applied indifferently to all who made any profeſſion of learning; or who knew how to manage the pen; though originally it was appropriated to eccleſiaſtics. As the nobility and gentry were uſually brought up to the exerciſe of arms, there were none but the clergy left to cultivate the ſciences: hence, as it was the clergy alone who had made any profeſſion of letters, a very learned man came to be called a *great clerk*, and a ſtupid ignorant man a *bad clerk*.

Clerk is alſo applied to ſuch as by their courſe of life exerciſe their pens in any court or office; of which there are various kinds: thus,

Clerk of the Bails, an officer in the court of king's bench, whoſe buſineſs is to file all bail-pieces taken in that court, where he always attends.

Clerk of the Check, an officer belonging to the king's court; ſo called, becauſe he has the check and controulment of the yeomen that belong to the king, queen, or prince. He likewiſe, by himſelf or deputy, ſets the watch in the court. There is alſo an officer in the navy of the ſame name, belonging to the king's yards.

Clerk of the Crown, an officer in the king's bench, who frames, reads, and records all indictments againſt offenders, there arraigned or indicted of any public crime. He is likewiſe termed *clerk of the crown-office*, in which capacity he exhibits information by order of the court for divers offences.

Clerk of the Crown, in chancery, an officer whoſe buſineſs it is conſtantly to attend the lord chancellor in perſon or by deputy; to write and prepare for the great ſeal ſpecial matters of ſtate by commiſſion, both ordinary and extraordinary, viz. commiſſions of lieutenancy, of juſtices of aſſize, oyer and terminer, gaol-delivery, and of the peace; all general pardons, granted either at the king's coronation, or in parliament; the writs of parliament, with the names of the knights, citizens, and burgeſſes, are alſo returned into his office. He alſo makes out ſpecial pardons and writs of execution on bonds of ſtatute ſtaple forfeited.

Clerk of the Deliveries of the Ordnance. See Ordnance.

Clerk of the Errors, in the court of common pleas, an officer who tranſcribes and certifies into the king's bench the tenor of the record of the action on which the writ of error, made out by the curſitor, is brought there to be determined. In the king's bench, the clerk of the errors tranſcribes and certifies the records of cauſes, by bill, in that court, into the exchequer. And the buſineſs of the clerk of the errors in the exchequer, is to tranſcribe the records certified thither out of the king's bench, and to prepare them for judgment in the exchequer-chamber.

Clerk of the Eſſoins, in the court of common pleas, keeps the eſſoin roll, or enters eſſoins: he alſo provides parchment, cuts it into rolls, marks the numbers on them, delivers out all the rolls to every officer, and receives them again when written. See Essoin.

Clerk of the Eſtreats, an officer in the exchequer, who every term receives the eſtreats out of the lord-treaſurer's remembrancer's office, and writes them out to be levied for the crown.

Clerk of the Green cloth, formerly an officer in chancery, but now aboliſhed.

Clerk of the Hamper or *Hanaper*, an officer in chancery, whoſe buſineſs is to receive all money due to the king for the ſeals of charters, letters patent, commiſſions, and writs; alſo the fees due to the officers for enrolling and examining them.

Clerk-Comptroller of the King's Houſehold, an officer of the king's court, authorized to allow or diſallow the charges of purſuivants, meſſengers of the green-cloth, &c. to inſpect and controul all defects of any of the inferior officers; and to ſit in the counting-houſe with the lord-ſteward and other officers of the houſehold for regulating ſuch matters.

Clerk of the King's Silver, an officer of the common pleas, to whom every fine is brought, after it has paſſed the office of the *cuſtos brevium*; and who enters the effect of writs of covenant, into a book kept for that purpoſe, according to which all the fines of that term are recorded in the rolls of the court.

Clerk of the Market, an officer of the king's houſe, to whom is given the charge of the king's meaſures and weights, the ſtandards of thoſe that ought to be uſed all over England.

Clerk of the Nichils or *Nihils*, an officer of the exchequer, who makes a roll of all ſuch ſums as are nichilled by the ſheriffs upon their eſtreats of green wax, and delivers them into the remembrancer of the treaſury, to have execution done upon them for the king. See Nihil.

Clerk of the Ordnance. See Ordnance.

Clerk of the Outlawries, an officer of the common pleas, and deputy to the attorney-general, for making out all writs of *capias utlegatum* after outlawry, to which there muſt be the king's attorney's name.

Clerk of the Paper office, an officer belonging to the king's bench, whoſe buſineſs is to make up the paper-books of ſpecial pleadings in that court.

Clerk of the Peace, an officer belonging to the ſeſſions of the peace, whoſe buſineſs is to read indictments, inrol the proceedings, and draw the proceſs: he likewiſe certifies into the king's bench tranſcripts of indictments, outlawries, attainders, and convictions had before the juſtices of peace, within the time limited by ſtatute, under a certain penalty. This office is in the gift of the *cuſtos rotulorum*, and may be executed by deputy.

Clerk of the Pells, an officer that belongs to the exchequer, whoſe buſineſs is to enter every teller's bill into a parchment-roll called *pellis receptorum*; and to make another roll of payments called *pellis exituum*.

Clerk of the Petty Bag, an officer of the court of chancery, whereof there are three, the maſter of the rolls being the chief: their buſineſs is to record the return of all inquiſitions out of every ſhire; to make out patents of cuſtomers, gaugers, comptrollers, &c.; liberates upon extent of ſtatutes-ſtaple; *conge d'elires* for biſhops; ſummons of the nobility, clergy, and burgeſſes to parliament; and commiſſions directed to knights and others of every ſhire, for aſſeſſing ſubſidies and taxes.

Clerk of the Pipe, an officer of the exchequer, who having the accounts of all debts due to the king, delivered out of the remembrancer's office, charges them in a great roll folded up like a pipe. He writes out warrants to ſheriffs, to levy the ſaid debts on the goods and chattels of the debtors; and if they have no goods, then he draws them down to the treaſurer's remembrancer to write eſtreats againſt their lands.

Clerk of the Pleas, an officer of the exchequer, in whoſe office all the officers of the court, having ſpecial privilege, ought to ſue or to be ſued in any action. In this office alſo actions at law may be proſecuted by other perſons, but the plaintiff ought to be tenant or debtor to the king, or ſome way accountable to him. The under clerks are attorneys in all ſuits.

Clerks of the Privy-ſeal, four officers that attend the lord privy ſeal, for writing and making out all things that are ſent by warrant from the ſignet to the privy ſeal, and to be paſſed the great ſeal; and likewiſe to make out privy ſeals, upon ſpecial occaſions of his majeſty's affairs, as for loan of money or the like.

Clerk of the Rolls, an officer of the chancery, whoſe buſineſs is to make ſearches after, and copies of deeds, officers, &c.

Clerk of the Signet, an officer continually attending upon his majeſty's principal ſecretary, who has the cuſtody of the privy ſignet, as well for ſealing the king's private letters as thoſe grants which paſs the king's hand by bill ſigned. There are four of theſe officers who have their diet at the ſecretary's table.

Six Clerks, officers in chancery next in degree below the twelve maſters, whoſe buſineſs is to inrol commiſſions, pardons, patents, warrants, &c. which paſs the great ſeal. They were anciently *clerici*, and forfeited their places if they married. Theſe are alſo attorneys for parties in ſuits depending in the court of chancery.

Clerk of the Treaſury, an officer belonging to the court of common pleas, who has the charge of keeping the records of the court, makes out all records of *niſi prius*, and likewiſe all exemplifications of records being in the treaſury. He has the fees due for all ſearches; and has under him an under keeper, who always keeps one key of the treaſury-door.

Clerk of the Warrants, an officer of the common pleas, whoſe buſineſs is to enter all warrants of attorney for plaintiffs and defendants in ſuit; and to inrol deeds of bargain and ſale, that are acknowledged in court, or before a judge. His office is likewiſe to eſtreat into the exchequer all iſſues, fines, eſtreats, and amercements, which grow due to the crown in that court.

CLERKE, Captain Charles, a celebrated Engliſh navigator, was bred up in the navy from his youth, and was preſent in ſeveral actions during the war of 1755. In that between the Bellona and Courageaux he was in great danger; for having been ſtationed in the mizen-top on board the former, the maſt was carried overboard by a ſhot, and he fell into the ſea along with it; but, however, was taken up without having received any injury. When Commodore Byron made his firſt voyage round the world, Mr Clerke ſerved on board his ſhip in quality of a midſhipman; and was afterwards on the American ſtation. In the year 1768, he ſailed round the world a ſecond time in the Endeavour, on board of which he ſerved in the ſtation of maſter's mate; but, during the voyage, ſucceeded to a lieutenancy. He returned in 1775, and was ſoon after appointed maſter and commander. When Captain Cook undertook his laſt voyage, Mr Clerke was appointed captain of the Diſcovery; and in conſequence of the death of Captain Cook, naturally ſucceeded to the ſupreme command. He did not, however, long enjoy his new dignity. Before his departure from England, he had manifeſt ſymptoms of a conſumption. Of this diſeaſe he lingered during the whole of the voyage; and his long reſidence in the cold northern climates cut off all hopes of recovery; but though ſenſible that the only chance he had of prolonging his life was by a ſpeedy return to a warmer climate, his attention to his duty was ſo great, that he perſevered in ſearch of a paſſage between the Aſiatic and American continents until every one of the officers was of opinion that it was impracticable. He bore his diſtemper with great firmneſs and equanimity, retaining a good flow of ſpirits to the laſt; and died on the 22d of Auguſt 1778, in the 38th year of his age, the ſhip then being within view of the coaſt of Kamtſchatka.

Clerke's *Iſland* lies on the weſtern ſide of the American continent, in N. Lat. 63. 15. and E. Long. 169. 30. It was diſcovered by Captain Cook in his laſt voyage, but a landing could not be effected. At a diſtance it appeared to be of conſiderable extent, and to have ſeveral hills connected with the low grounds in ſuch a manner as to make it look like a group of iſlands. Near its eaſtern extremity is a little iſland remarkable for having three elevated rocks upon it. Both the large and ſmall iſland are uninhabited.

CLERMONT, a conſiderable, rich, and populous town of France, in Auvergne, with a biſhop's ſee. The cathedral, the public ſquares, and the walks, are very fine. Here is a bridge naturally formed, as they pretend, by the petrifying quality of a fountain. E. Long. 3. 10. N. Lat. 45. 47.

Clermont *Manuſcript*, is a copy of St Paul's Epiſtles, found in the monaſtery of Clermont in France, and uſed by Beza, together with the Cambridge MS. in preparing his edition of the New Teſtament. This copy is in the octavo form, and is written on fine vellum in Greek and Latin, with ſome mutilations. Beza ſuppoſes that it is of equal antiquity with the Cambridge copy; but both were probably written by a Latin ſcribe in a later period than he aſſigns to them. The various readings of this MS. were communicated to Archbiſhop Uſher, and they are preſerved by Walton. The MS. itſelf was in the poſſeſſion of Morinus; and after his death depoſited among the MS. copies of the Royal Library at Paris, N° 2245.

CLEROMANCY, a kind of divination performed by the throwing of dice, or little bones; and obſerving the points, or marks, turned up. The word comes from κλῆρος, "lot," and μαντεια, "divination." At Bura, a city of Achaia, was a temple and celebrated oracle of Hercules, where ſuch as conſulted the oracle, after praying to the idol, threw four dice, the points whereof being well ſcanned by the prieſt, he was ſuppoſed to draw an anſwer from them.

Something of this kind ſeems to have been practiſed with regard to Jonah.

CLERVAL, a town of France, in the Franche Comté, ſeated on the river Doux, belonging to the houſe of Wirtemburgh, but depends on the crown of France. E. Long. 5. 57. N. Lat. 46. 35.

CLERVAUX, one of the moſt celebrated and fineſt abbeys of France, in Champagne, five miles from Bar-ſur-Aube, and ſeated in a valley ſurrounded with woods and mountains. It is the chief of the Ciſtercian order. Here is the famous Tun of St Bernard, which will hold 800 tuns of wine. Near this abbey is a ſmall town.

CLESIDES, a Greek painter, about 276 years before Chriſt in the reign of Antiochus I. He revenged the injuries he had received from Queen Stratonice, by repreſenting her in the arms of a fiſherman. However indecent the painter might repreſent the queen, ſhe was drawn with ſuch perſonal beauty, that ſhe preſerved the piece and liberally rewarded the artiſt.

CLETHRA. See Botany *Index*.

CLEVELAND, a diſtrict in the north riding of Yorkſhire in England, from whence the noble family of Fitzroy took the title of duke, but which is now extinct.

Cleveland, *John*, an Engliſh poet of ſome eminence in his time, who during the civil war under Charles I. engaged as a literary champion in the royal cauſe againſt the parliamentarians. He died in 1658, and was much extolled by his party. His works, which conſiſt of poems, characters, orations, epiſtles, &c. were printed in octavo in 1677.

CLEVES, the duchy of, a province of the circle of Weſtphalia, in Germany. It is divided into two parts by the Rhine, and is about 40 miles in length from eaſt to weſt, and 20 in breadth from north to ſouth. It is a fine agreeable country, and pretty populous. The towns are, Cleves the capital, Calcar, Gennet, Santen, Orſoy, Bureck, and Greit. Theſe lie on the left ſide of the river. On the right, Dayſourgh, Weſe, Rees, and Emmerick. There have been great conteſts about this duchy, but it now belongs to the king of Pruſſia.

Cleves, a city of Germany, in the duchy of Cleves, of which it is the capital. It ſtands upon a pleaſant hill, about a mile from the Rhine, with which it communicates, by means of a canal which is large enough for great barges. The caſtle ſtands upon a mountain, and, though old, is very agreeable. It was built in the time of Julius Cæſar. It was taken by the

French in 1794. Calviniſts, Lutherans, and Roman Catholics, are all tolerated in this city. E. Long. 5. 50. N. Lat. 51. 45.

CLIENT, among the Romans, a citizen who put himſelf under the protection of ſome great man, who in reſpect of that relation was called *patron*.

This patron aſſiſted his client with his protection, intereſt, and goods; and the client gave his vote for his patron, when he ſought any office for himſelf or his friends. Clients owed reſpect to their patrons, as theſe owed them their protection.

The right of patronage was appointed by Romulus, to unite the rich and poor together, in ſuch a manner as that one might live without contempt and the other without envy; but the condition of a client, in courſe of time, became little elſe than a moderate ſlavery.

Client is now uſed for a party in a law-ſuit, who has turned over his cauſe into the hands of a counſellor or ſolicitor.

CLIFFORTIA. See Botany *Index*.

CLIMACTERIC, among phyſicians, (from *climacter*, "a ladder"), a critical year in a perſon's life.

According to ſome, this is every ſeventh year; but others allow only thoſe years produced by multiplying 7 by the odd number 3, 5, 7, and 9, to be climacterical. Theſe years, they ſay, bring with them ſome remarkable change with reſpect to health, life, or fortune: the grand climacteric is the 63d year; but ſome, making two, add to this the 81ſt: the other remarkable climacterics are the 7th, 21ſt, 35th, 49th, and 56th.

CLIMATE, or Clime, in *Geography*, a part of the ſurface of the earth, bounded by two circles parallel to the equator, and of ſuch a breadth, as that the longeſt day in the parallel neareſt the pole exceeds the longeſt day in that next the equator by ſome certain ſpaces, viz. half an hour. The word comes from the Greek κλιμα, *inclinamentum*, "an inclination."

The *beginning* of the climate is a parallel circle wherein the day is the ſhorteſt. The *end* of the climate, is that wherein the day is the longeſt. The climates therefore are reckoned from the equator to the pole; and are ſo many bands, or zones, terminated by lines parallel to the equator; though, in ſtrictneſs, there are ſeveral climates in the breadth of one zone. Each climate only differs from its contiguous ones, in that the longeſt day in ſummer is longer or ſhorter by half an hour in the one place than in the other. As the climates commence from the equator, the firſt climate at its beginning has its longeſt day preciſely 12 hours long; at its end, 12 hours and a half: the ſecond, which begins where the firſt ends, viz. at twelve hours and a half, ends at 13 hours; and ſo of the reſt, as far as the polar circles, where what the geographers call *hour climates*, terminate, and *month-climates* commence. An hour-climate is a ſpace compriſed between two parallels of the equator, in the firſt of which the longeſt day exceeds that in the latter by half an hour; ſo the month-climate is a ſpace terminated between two circles parallel to the polar circles, whoſe longeſt day is longer or ſhorter than that of its contiguous one by a month or 30 days.

The ancients, who confined the climates to what they imagined the habitable parts of the earth, only allowed of ſeven. The firſt they made to paſs through Meroe, the ſecond through Sienna, the third through Alexandria, the fourth through Rhodes, the fifth through Rome, the ſixth through Pontus, and the ſeventh through the mouth of the Boryſthenes. The moderns, who have ſailed further toward the poles, make 30 climates on each ſide; and, in regard the obliquity of the ſphere makes a little difference in the length of the longeſt day, inſtead of half an hour, ſome of them only make the difference of climates a quarter.

Vulgarly the term *climate* is beſtowed on any country or region differing from another either in reſpect of the ſeaſons, the quality of the ſoil, or even the manners of the inhabitants; without any regard to the length of the longeſt day. Abulfeda, an Arabian author, diſtinguiſhes the firſt kind of climates by the term *real climates*, and the latter by that of *apparent climates*. Varenius gives us a table of 30 climates; but without any regard to the refraction. Ricciolus furniſhes a more accurate one, wherein the refractions are allowed for; an abſtract of which follows:

Middle of *Clim.*	Longeſt Day.	Latit.	Middle of *Clim.*	Longeſt Day.	Latit.	Middle of *Clim.*	Latit.	Cont. Light.	North Night.	Cont. Light.	South Night.
I	12th 30	7° 18	VIII	16th 0	48 15	XV	66 53	31^{d}	27^{d}	30^{d}	28^{d}
II	13 0	15 36	IX	17 0	53 46	XVI	69 30	62	58	60	59
III	13 30	23 8	X	18 0	57 44	XVII	73 0	93	87	89	88
IV	14 0	29 49	XI	19 0	60 39	XVIII	78 6	124	117	120	118
V	14 30	35 35	XII	20 0	62 44	XIX	84 0	156	148	150	149
VI	15 0	40 32	XIII	22 0	65 10	XX	90 0	188	180	178	177
VII	15 30	44 42	XIV	24 0	65 54						

CLIMAX, or Gradation, in *Rhetoric*, a figure wherein the word or expreſſion which ends the firſt member of a period begins the ſecond, and ſo on; ſo that every member will make a diſtinct ſentence, taking its riſe from the next foregoing, till the argument and period be beautifully finiſhed; as in the following gradation of Dr Tillotſon. "After we have practiſed good actions a while, they become eaſy; and when they are eaſy, we begin to take pleaſure in them; and when they pleaſe us we do them frequently; and by frequency of acts, a thing grows into a habit; and confirmed habit is a kind of ſecond nature; and ſo far as any thing is natural, ſo far it is neceſſary; and we can hardly do otherwiſe; nay, we do it many times when we do not think of it."

CLINCH, in the ſea language, that part of a cable which is bended about the ring of the anchor, and then ſeized or made faſt.

CLINCHING, in the ſea-language, a kind of ſlight caulking uſed at ſea, in a proſpect of foul weather, about the poſts: it conſiſts in driving a little oakum into their ſeams, to prevent the water coming in at them.

CLINIC, a term applied by the ancient church-hiſtorians to thoſe who receive baptiſm on their death-bed.

Clinic Medicine, was particularly uſed for the method of viſiting and treating ſick perſons in bed, for the more exact diſcovery of all the ſymptoms of their diſeaſe.

CLINIAS, a Pythagorean philoſopher, and muſician, in the 65th Olympiad. He was wont to aſſuage his paſſion, being very choleric, by his lyre.

CLINOPODIUM, field basil. See Botany *Index*.

CLIO, in Pagan mythology, the firſt of the muſes, daughter of Jupiter and Mnemoſyne. She preſided over hiſtory. She is repreſented crowned with laurels, holding in one hand a trumpet, and a book in the other. Sometimes ſhe holds a plectrum or quill with a lute. Her name ſignifies honour and reputation, κλεος, *gloria*; and it was her office faithfully to record the actions of brave and illuſtrious heroes. She had Hyacintha by Pierius, ſon of Magnes.

Clio, in *Zoology*, a genus of inſects belonging to the order of vermes molluſca. The body is oblong and fitted for ſwimming; and it has two membranaceous wings placed oppoſite to each other. The ſpecies are three, principally diſtinguiſhed by the ſhape of their vagina, and are all natives of the ocean.

CLIPEUS, in *Natural Hiſtory*, a name given to the flat depreſſed centroniæ, from their reſembling a ſhield. See Centronia.

CLISTHENES, a famous Athenian magiſtrate, the author of the mode of baniſhing ambitious citizens by oſtraciſm, or writing their names upon a ſhell; the intention was patriotic, but it was abuſed like all other human inſtitutions; ſome of the worthieſt citizens of Athens being thus exiled. He died 510 years before Chriſt.

CLITOMACHUS, the philoſopher, flouriſhed about 140 years before Chriſt. He was born at Carthage; quitted his country at 40 years of age; and went to Athens, where he became the diſciple and ſucceſſor of Carneades. He compoſed many books, but they are all loſt.

CLITORIA. See Botany *Index*.

CLITORIS, in *Anatomy*, is a part of the external pudenda, ſituated at the angle which the nymphæ form with each other. Like the penis it has an erection, and is thought to be the principal ſeat of venereal pleaſure. The clitoris is of different ſizes in different women; but in general it is ſmall, and covered with the labia. The preternaturally enlarged clitoris is what conſtitutes an hermophradite. When the clitoris is too large, it may be ſo extirpated as to remove the unneceſſary part; but this requires much care, for a farther extirpation ſubjects the patient to an involuntary diſcharge of urine.

CLITUMNUS, in *Ancient Geography*, a river of Umbria, on this ſide the Apennines. According to Pliny, it was a fountain conſiſting of ſeveral veins, ſituated between Hiſpellum and Spoletium; which ſoon after ſwelled into a very large and navigable river, running from eaſt to weſt into the Tinia, and both together into the Tyber. A river famous for its milk-white flocks and herds, (Virgil). The god of the river was called *Clitumnus*.

CLITUS, brother to Alexander the Great's nurſe, followed that prince in his conqueſts, and ſaved his life by cutting off the hand of Roſaces, who held an axe lifted up to kill him at the paſſage of the Granicus. Alexander, who had a great regard for him, ſome time after invited him to ſupper; when Clitus, at the end of the repaſt, being heated with wine, diminiſhed the exploits of that prince, in order to magnify thoſe of Philip his father. This ſo enraged Alexander, that he killed him with his own hand; but he was afterwards ſo afflicted at it, that he attempted his own life.

CLIVE, Robert, Lord, ſon of Richard Clive, Eſq; of Styche near Drayton in Salop, was born in 1725. Toward the cloſe of the war in 1741, he was ſent as a writer in the Eaſt India ſervice to Madras; but being fonder of the camp than the compting-houſe, he ſoon availed himſelf of an opportunity to exchange his pen for a pair of colours. He firſt diſtinguiſhed himſelf at the ſiege of Pondicherry in 1748; acted under Major Laurence at the taking of Devi Cotta in Tanjore, who wrote of his military talents in high terms; commanded a ſmall party for the taking of Arcot, and afterward defended that place againſt the French; and performed many other exploits, which, conſidering the remoteneſs of the ſcene of action, would require a long detail to render ſufficiently intelligible. He was, however, in brief, looked upon and acknowledged as the man who firſt rouſed his countrymen to ſpirited action, and raiſed their reputation in the Eaſt; ſo that when he came over to England in 1753, he was preſented, by the court of directors, with a rich ſword ſet with diamonds, as an acknowledgment of paſt, and an incitement to future, ſervices. Captain Clive returned to India, in 1755, as governor of Fort St David, with the rank of lieutenant-colonel in the king's troops; when as commander of the company's troops, he, in conjunction with Admiral Watſon, reduced Angria the pirate, and became maſter of Geria, his capital, with all his accumulated treaſure. On the loſs of Calcutta and the well known barbarity of the ſoubah Surajah Dowla, they ſailed to Bengal; where they took Fort William, in January 1757; and Colonel Clive defeating the ſoubah's army ſoon after, accelerated a peace. Surajah Dowla's perfidy, however, ſoon produced freſh hoſtilities, which ended in his ruin; he being totally defeated by Colonel Clive at the famous battle of Plaſſey. The next day, the conqueror entered Muxadabad in triumph; and placed Jaffier Ally Cawn, one of the principal generals, on the throne; the depoſed ſoubah was ſoon after taken, and privately put to death by Jaffier's ſon. Admiral Watſon died at Calcutta; but Colonel Clive commanded in Bengal the two ſucceeding years; he was honoured by the Mogul with the dignity of an omrah of the empire; and was rewarded by the new ſoubah with a grant of lands, or a jaghire, producing 27,000l. a-year. In 1760, he returned to England, where he received the unanimous thanks of the company, was elected member of parliament for Shrewſbury, and was raiſed to an Iriſh peerage by the title of Lord Clive Baron of Plaſſey. In 1764, freſh diſturbances taking place in Bengal, Lord Clive was eſteemed the only man qualified to ſettle them, and was accordingly again appointed to that preſidency; after being honoured with the order of the Bath, and with the rank of major-general. When he arrived in India, he exceeded the moſt ſanguine expectation, in reſtoring tranquillity to the province without ſtriking a blow, and fixed the higheſt ideas of the Britiſh power in the minds of the natives. He returned home in 1767; and, in 1772, when a parliamentary inquiry into the conduct of the Eaſt India company was agitated, he entered into an able juſtification of himſelf in a maſterly ſpeech in the houſe of commons. He died *ſuddenly* towards the cloſe of the year 1774.

CLOACÆ, in antiquity, the common ſewers of Rome, to carry off the dirt and ſoil of the city into the Tiber; juſtly reckoned among the grand works of the Romans. The firſt common ſewer, called *Cloaca Maxima*, was built by Tarquinius, ſome ſay Priſcus, others Superbus, of huge blocks of ſtone joined together without any cement, in the manner of the edifices of thoſe early times; conſiſting of three rows of arches one above another, which at length conjoin and unite together; meaſuring in the clear 18 palms in height, and as many in width. Under theſe arches, they rowed in boats, which made Pliny ſay that the city was ſuſpended in air, and that they ſailed beneath the houſes. Under theſe arches alſo were ways through which carts loaded with hay could paſs with eaſe. It began in the Forum Romanum; meaſured 300 paces in length; and emptied itſelf between the temple of Veſta and the Pons Senatorius. There were as many principal ſewers as there were hills. Pliny concludes their firmneſs and ſtrength from their ſtanding for ſo many ages the ſhocks of earthquakes, the fall of houſes, and the vaſt loads and weights moved over them.

CLOACINA, the goddeſs of jakes and common ſewers, among the Romans.

CLOCK, a machine conſtructed in ſuch a manner, and regulated ſo by the uniform motion of a pendulum (A), as to meaſure time, and all its ſubdiviſions, with great exactneſs.

The invention of clocks with wheels is referred to Pacificus, archdeacon of Verona, who lived in the time of Lotharius ſon of Louis the Debonnair, on the credit of an epitaph quoted by Ughelli, and borrowed by him from Panvinius. They were at firſt called *nocturnal dials*, to diſtinguiſh them from ſun-dials, which ſhowed the hour by the ſun's ſhadow. Others aſcribe the invention to Boethius, about the year of 510. Mr Derham makes clock-work of a much older ſtanding; and ranks Archimedes's ſphere mentioned by Claudian, and that of Poſidonius mentioned by Cicero, among the machines of this kind: not that either their form or uſe were the ſame with thoſe of ours, but that they had their motion from ſome hidden weights or ſprings, with wheels, or pulleys, or ſome ſuch clock-work principle. But be this as it will, it is certain the art of making clocks, ſuch as are now in uſe, was either firſt invented, or at leaſt retrieved, in Germany, about 200 years ago. The water-clocks, or clepſydræ, and ſun-dials, have both a much better claim to antiquity. The French annals mention one of the former kind ſent by Aaron, king of Perſia, to Charlemagne, about the year 807, which ſeemed to bear ſome reſemblance to the modern clocks: it was of braſs, and ſhowed the hours by twelve little balls of the ſame metal, which fell at the end of each hour, and in falling ſtruck a bell and made it ſound. There were alſo figures of 12 cavaliers, which at the end of each hour came forth at certain apertures or windows in the ſide of the clock, and ſhut them again, &c.

The invention of pendulum clocks is owing to the happy induſtry of the laſt age: the honour of it is diſputed by Huygens and Galileo. The former, who has written a volume on the ſubject, declares it was firſt put in practice in the year 1657, and the deſcription thereof printed in 1657. Becher, *de Nova Temporis dimetiendi Theoria, anno* 1680, contends for Galileo; and relates, though at ſecond hand, the whole hiſtory of the invention; adding, that one Treſler, clock-maker to the then father of the Grand Duke of Tuſcany, made the firſt pendulum-clock at Florence, by direction of Galileo Galilei; a pattern of which was brought into Holland. The Academy de'l Cimento ſay expreſsly, that the application of the pendulum to the movement of a clock was firſt propoſed by Galileo, and firſt put in practice by his ſon Vincenzo Galilei, in 1649. Be the inventor who he will, it is certain the invention never flouriſhed till it came into Hugyens's hands, who inſiſts on it, that if ever Galileo thought of ſuch a thing, he never brought it to any degree of perfection. The firſt pendulum-clock made in England was in the year 1662, by Mr Fromantil, a Dutchman.

Amongſt the modern clocks, thoſe of Straſburg and Lyons are very eminent for the richneſs of their furniture, and the variety of their motions and figures. In the firſt, a cock claps his wings, and proclaims the hour; the angel opens a door, and ſalutes the virgin; and the Holy Spirit deſcends on her, &c. In the ſecond, two horſemen encounter, and beat the hour on each other; a door opens, and there appears on the theatre the Virgin, with Jeſus Chriſt in her arms; the Magi, with their retinue, marching in order, and preſenting their gifts; two trumpeters ſounding all the while to proclaim the proceſſion. Theſe, however, are excelled by two lately made by Engliſh artiſts, and intended as a preſent from the Eaſt India company to the emperor of China. The clocks we ſpeak of are in the form of chariots, in which are placed, in a fine attitude,

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(A) A balance not unlike the fly of a kitchen-jack was formerly uſed in place of the pendulum.

attitude, a lady, leaning her right hand upon a part of the chariot, under which is a clock of curious workmanſhip, little larger than a ſhilling, that ſtrikes and repeats, and goes eight days. Upon her finger ſits a bird finely modelled, and ſet with diamonds and rubies, with its wings expanded in a flying poſture, and actually flutters for a conſiderable time on touching a diamond button below it; the body of the bird (which contains part of the wheels that in a manner give life to it) is not the bigneſs of the 16th part of an inch. The lady holds in her left hand a gold tube not much thicker than a large pin, on the top of which is a ſmall round box, to which a circular ornament ſet with diamonds not larger than a ſixpence is fixed, which goes round near three hours in a conſtant regular motion. Over the lady's head, ſupported by a ſmall fluted pillar no biggar than a quill, is a double umbrella, under the largeſt of which a bell is fixed at a conſiderable diſtance from the clock, and ſeems to have no connection with it; but from which a communication is ſecretly conveyed to a hammer, that regularly ſtrikes the hour, and repeats the ſame at pleaſure, by touching a diamond button fixed to the clock below. At the feet of the lady is a gold dog; before which from the point of the chariot are two birds fixed on ſpiral ſprings; the wings and feathers of which are ſet with ſtones of various colours, and appear as if flying away with the chariot, which, from another ſecret motion, is contrived to run in a ſtraight, circular, or any other direction; a boy that lays hold of the chariot, behind, ſeems alſo to puſh it forward. Above the umbrella are flowers and ornaments of precious ſtones; and it terminates with a flying dragon ſet in the ſame manner. The whole is of gold, moſt curiouſly executed, and embelliſhed with rubies and pearls.

Of the general Mechaniſm of Clocks, *and how they meaſure Time.* The firſt figure of Plate CXLVI. is a profile of a clock. P is a weight that is ſuſpended by a rope that winds about the cylinder or barrel C, which is fixed upon the axis *a a*; the pivots *b b* go into holes made in the plates TS, TS, in which they turn freely. Theſe plates are made of braſs or iron, and are connected by means of *four pillars* ZZ; and the whole together is called the *frame*.

The weight P, if not reſtrained, would neceſſarily turn the barrel C with an uniformly accelerated motion, in the ſame manner as if the weight was falling freely from a height. But the barrel is furniſhed with a ratchet wheel KK, the right ſide of whoſe teeth ſtrikes againſt the click, which is fixed with a ſcrew to the wheel DD, as repreſented in fig. 2. ſo that the action of the weight is communicated to the wheel DD, the teeth of which act upon the teeth of the ſmall wheel *d* which turns upon the pivots *c c*. The communication or action of one wheel with another is called the *pitching*; a ſmall wheel like *d* is called a *pinion*, and its teeth are leaves of the pinion. Several things are requiſite to form a good pitching, the advantages of which are obvious in all machinery where teeth and pinions are employed. The teeth and pinion leaves ſhould be of a proper ſhape, and perfectly equal among themſelves; the ſize alſo of the pinion ſhould be of a juſt proportion to the wheel acting into it; and its place muſt be at a certain diſtance from the wheel, beyond or within which it will make a bad pitching.

The wheel E E is fixed upon the axis of the pinion *d*; and the motion communicated to the wheel D D by the weight is tranſmitted to the pinion *d*, conſequently to the wheel E E, as likewiſe to the pinion *e* and wheel F F, which moves the pinion *f*, upon the axis of which the crown or balance wheel G H is fixed. The pivots of the pinion *f* play in holes of the plates L M, which are fixed horizontally to the plates T S. In a word, the motion begun by the weight is tranſmitted from the wheel G H to the palettes I K, and by means of the fork U X rivetted on the palettes, communicates motion to the pendulum A B, which is ſuſpended upon the hook A. The pendulum A B deſcribes, round the point A, an arc of a circle alternately going and returning. If then the pendulum be once put in motion by a puſh of the hand, the weight of the pendulum at B will make it return upon itſelf, and it will continue to go alternately backward and forward till the reſiſtance of the air upon the pendulum, and the friction at the point of ſuſpenſion at A, deſtroys the originally impreſſed force. But as, at every vibration of the pendulum, the teeth of the balance-wheel G H, act ſo upon the palettes I K (the pivots upon the axis of theſe palettes play in two holes of the potence *s t*), that after one tooth H has communicated motion to the palette K, that tooth eſcapes; then the oppoſite tooth G acts upon the palette I, and eſcapes in the ſame manner; and thus each tooth of the wheel eſcapes the palettes I K, after having communicated their motion to the palettes in ſuch a manner that the pendulum, inſtead of being ſtopt, continues to move.

The wheel E E revolves in an hour; the pivot *c* of the wheel paſſes through the plate, and is continued to *r*; upon the pivot is a wheel NN with a long ſocket faſtened in the centre; upon the extremity of this ſocket *r* the minute-hand is fixed. The wheel NN acts upon the wheel O; the pinion of which *p* acts upon the wheel *g g*, fixed upon a ſocket which turns along with the wheel N. This wheel *g g* makes its revolution in 12 hours, upon the ſocket of which the hour-hand is fixed.

From the above deſcription it is eaſy ſee, 1. That the weight *p* turns all the wheels, and at the ſame time continues the motion of the pendulum. 2. That the quickneſs of the motion of the wheels is determined by that of the pendulum. 3. That the wheels point out the parts of time divided by the uniform motion of the pendulum.

When the cord from which the weight is ſuſpended is entirely run down from off the barrel, it is wound up again by means of a key, which goes on the ſquare end of the arbor at Q by turning it in a contrary direction from that in which the weight deſcends. For this purpoſe, the inclined ſide of the teeth of the wheel R (fig. 2.) removes the click C, ſo that the ratchet-wheel R turns while the wheel D is at reſt; but as ſoon as the cord is wound up, the click falls in between the teeth of the wheel D, and the right ſide of the teeth again act upon the end of the click, which obliges the wheel D to turn along with the barrel; and the ſpring A keeps the click between the teeth of the ratchet-wheel R.

We ſhall now explain how time is meaſured by the motion of the pendulum; and how the wheel E, upon the axis of which the minute-hand is fixed, makes but one preciſe revolution in an hour. The vibrations of a pendulum are performed in a ſhorter or longer time in proportion to the length of the pendulum itſelf. A pendulum of 3 feet $8\frac{1}{2}$ French lines in length, makes 3600 vibrations in an hour, *i. e.* each vibration is performed in a ſecond of time, and for that reaſon it is called a *ſecond pendulum*. But a pendulum of 9 inches $2\frac{1}{4}$ French lines makes 7200 vibrations in an hour, or two vibrations in a ſecond of time, and is called *a half ſecond pendulum*. Hence, in conſtructing a wheel whoſe revolution muſt be performed in a given time, the time of the vibrations of the pendulum which regulates its motion muſt be conſidered. Suppoſing, then, that the pendulum AB makes 7200 vibrations in an hour, let us conſider how the wheel E ſhall take up an hour in making one revolution. This entirely depends on the number of teeth in the wheels and pinions. If the balance-wheel conſiſts of 30 teeth, it will turn once in the time that the pendulum makes 60 vibrations; for at every turn of the wheel, the ſame tooth acts once on the palette I, and once on the palette K, which occaſions two ſeparate vibrations in the pendulum; and the wheel having 30 teeth, it occaſions twice 30, or 60 vibrations. Conſequently, this wheel muſt perform 120 revolutions in an hour; becauſe 60 vibrations, which it occaſions at every revolution, are contained 120 times in 7200, the number of vibrations performed by the pendulum in an hour. Now, in order to determine the number of teeth for the wheels E F, and the pinions *e f*, it muſt be remarked, that one revolution of the wheel E muſt turn the pinion *e* as many times as the number of teeth in the pinions is contained in the number of teeth in the wheel. Thus, if the wheel E contains 72 teeth, and the pinion *e* 6, the pinion will make 12 revolutions in the time that the wheel makes 1; for each tooth of the wheel drives forward a tooth of the pinion, and when the 6 teeth of the pinion are moved, a complete revolution is performed; but the wheel E has by that time only advanced 6 teeth, and has ſtill 66 to advance before its revolution be completed, which will occaſion 11 more revolutions of the pinion. For the ſame reaſon, the wheel F having 60 teeth, and the pinion *f* 6, the pinion will make 10 revolutions while the wheel performs one. Now, the wheel F being turned by the pinion *e*, makes 12 revolutions for one of the wheel E; and the pinion *f* makes 10 revolutions for one of the wheel F; conſequently, the pinion *f* performs 10 times 12 or 120 revolutions in the time the wheel E performs one. But the wheel G, which is turned by the pinion *f*, occaſions 60 vibrations in the pendulum each time it turns round; conſequently the wheel G occaſions 60 times 120 or 7200 vibrations of the pendulum while the wheel E performs one revolution; but 7200 is the number of vibrations made by the pendulum in an hour, and conſequently the wheel E performs but one revolution in an hour; and ſo of the reſt.

From this reaſoning, it is eaſy to diſcover how a clock may be made to go for any length of time without being wound up: 1. By increaſing the number of teeth in the wheels: 2. By diminiſhing the number of teeth in the pinions; 3. By increaſing the length of the cord that ſuſpends the weight; 4. By increaſing the length of the pendulum; and, 5. By adding to the number of wheels and pinions. But in proportion as the time is augmented, if the weight continues the ſame, the force which it communicates to the laſt wheel GH will be diminiſhed.

It only remains to take notice of the number of teeth in the wheels which turn the hour and minute hands.

The wheel E performs one revolution in an hour; the wheel NN, which is turned by the axis of the wheel E, muſt likewiſe make only one revolution in the ſame time; and the minute-hand is fixed to the ſocket of this wheel. The wheel N has 30 teeth, and acts upon the wheel O, which has likewiſe 30 teeth, and the ſame diameter; conſequently the wheel O takes one hour to a revolution: now the wheel O carries the pinion *p*, which has 6 teeth, and which acts upon the wheel *q q* of 72 teeth; conſequently the pinion *p* makes 12 revolutions while the wheel *q q* makes one, and of courſe the wheel *q q* takes 12 hours to one revolution; and upon the ſocket of this wheel the hour-hand is fixed. All that has been ſaid here concerning the revolutions of the wheels, &c. is equally applicable to watches as to clocks.

The ingenious Dr Franklin contrived a clock to ſhow the hours, minutes, and ſeconds, with only three wheels and two pinions in the whole movement. The dial-plate (fig. 3.) has the hours engraven upon it in ſpiral ſpaces along two diameters of a circle containing four times 60 minutes. The index A goes round in four hours, and counts the minutes from any hour by which it has paſſed to the next following hour. The time, therefore, in the poſition of the index ſhown in the figure is either $32\frac{1}{2}$ minutes paſt XII. III. or VIII.; and ſo in every other quarter of the circle it points to the number of minutes after the hours which the index laſt left in its motion. The ſmall hand B, in the arch at top, goes round once in a minute, and ſhows the ſeconds. The wheel-work of this clock may be ſeen in fig. 4. A is the firſt or great wheel, containing 160 teeth, and going round in four hours with the index A in fig. 3. let down by a hole on its axis. This wheel turns a pinion B of 10 leaves, which therefore goes round in a quarter of an hour. On the axis of this pinion is the wheel C of 120 teeth; which goes round in the ſame time, and turns a pinion D of eight leaves round in a minute, with the ſecond hand B of fig. 3. fixed on its axis, and alſo the common wheel E of 30 teeth for moving a pendulum (by palettes) that vibrates ſeconds, as in a common clock. This clock is wound up by a line going over a pulley on the axis of the great wheel, like a common thirty-hour clock. Many of theſe admirably ſimple machines have been conſtructed, which meaſure time exceedingly well. It is ſubject, however, to the inconvenience of requiring frequent winding by drawing up the weight, and likewiſe to ſome uncertainty as to the particular hour ſhown by the index A. Mr Ferguſon has propoſed to remedy theſe inconveniences by the following conſtruction. In the dial-plate of his clock (fig. 5.) there is an opening, *a b c d*, below the centre, through which appears part of a flat plate, on which the 12 hours, with their diviſions into quarters, are engraved. This plate turns round in 12 hours; and the index A points out the true hour, &c. B is the minute-hand, which goes round the large circle of 60 minutes whilſt the plate *a b c d* ſhifts its place one hour under the fixed index A. There is another opening, *e f g*, through which the ſeconds are ſeen on a flat moveable ring at the extremity of a fleur-de-lis engraved on the dial-plate. A in fig. 6. is the great wheel of this clock, containing 120 teeth, and turning round in 12 hours. The axis of this wheel bears the plate of hours, which may be moved by a pin paſſing through ſmall holes drilled in the plate, without affecting the wheel-work. The great wheel A turns a pinion B of ten leaves round in an hour, and carries the minute hand B on its axis round the dial-plate in the ſame time. On this axis is a wheel C of 120 teeth, turning round a pinion D of ſix leaves in three minutes; on the axis of which there is a wheel E of 90 teeth, that keeps a pendulum in motion, vibrating ſeconds by palettes, as in a common clock, when the pendulum-wheel has only 30 teeth, and goes round in a minute. In order to ſhow the ſeconds by this clock, a thin plate muſt be divided into three times ſixty, or 180 equal parts, and numbered 10, 20, 30, 40, 50, 60, three times ſucceſſively; and fixed on the ſame axis with the wheel of 90 teeth, ſo as to turn round near the back of the dial-plate; and theſe diviſions will ſhow the ſeconds through the opening *e f g h*, fig. 5. This clock will go a week without winding, and always ſhow the preciſe hour; but this clock, as Mr Ferguſon candidly acknowledges, has two diſadvantages of which Dr Franklin's clock is free. When the minute hand B is adjuſted, the hour-plate muſt alſo be ſet right by means of a pin; and the ſmallneſs of the teeth in the pendulum-wheel will cauſe the pendulum ball to deſcribe but ſmall arcs in its vibrations; and therefore the momentum of the ball will be leſs, and the times of the vibrations will be more affected by any unequal impulſe of the pendulum-wheel on the palettes. Beſides, the weight of the flat ring on which the ſeconds are engraved will load the pivots of the axis of the pendulum-wheel with a great deal of friction, which ought by all poſſible means to be avoided. To remedy this inconvenience, the ſecond plate might be omitted.

A clock ſimilar to Dr Franklin's was made in Lincolnſhire about the end of laſt century or beginning of this; and is now in London in the poſſeſſion of a grandſon of the perſon who made it.

Plate CXLVII.

A clock, ſhowing the apparent diurnal motions of the ſun and moon, the age and phaſes of the moon, with the time of her coming to the meridian, and the times of high and low water, by having only two wheels and a pinion added to the common movement, was contrived by Mr Ferguſon, and deſcribed in his Select Exerciſes. The dial-plate of this clock (fig. 7.) contains all the twenty-four hours, of the day and night. S is the ſun, which ſerves as an hour index by going round the dial-plate in twenty-four hours; and M is the moon, which goes round in twenty-four hours fifty minutes and a half, the time of her going round in the heavens from one meridian to the ſame meridian again. The ſun is fixed to a circular plate (ſee fig. 8.) and carried round by the motion of that plate on which the twenty-four hours are engraven; and within them is a circle divided into twenty-nine and a half equal parts for the days of the moon's age, reckoning from new moon to new moon; and each day ſtands directly under the time, in the twenty-four hour circle of the moon's coming to the meridian; the XII under the ſun ſtanding for noon, and the oppoſite XII for midnight. The moon M is fixed to another circular plate (fig. 6.) of the ſame diameter with that which carries the ſun, part of which may be ſeen through the opening, over which the ſmall wires *r* and *b* paſs in the moon-plate. The wire *a* ſhows the moon's age and time of her coming to the meridian, and *b* ſhows the time of high-water for that day in the ſun-plate. The diſtance of theſe wires anſwers to the difference of time between the moon's coming to the meridian and high-water at the place for which the clock is made. At London their difference is two hours and a half. Above the moon-plate there is a fixed plate N, ſupported by a wire A, joined to it at one end, and fixed at right angles into the dial-plate at the midnight XII. This plate may repreſent the earth, and the dot L London, or the place to which the clock is adapted. Around this plate there is an elliptic ſhade on the moon-plate, the higheſt points of which are marked high-water and the loweſt low-water. As this plate turns round below the plate N, theſe points come ſucceſſively even with L, and ſtand over it at the times when it is high or low water at the given place; which times are pointed by the ſun S on the dial-plate; and the plate H above XII at noon riſes or falls with the tide. As the ſun S goes round the dial-plate in twenty-four hours, and the moon M in twenty-four hours fifty minutes and a half, it is plain that the moon makes only twenty-eight revolutions and a half, whilſt the ſun makes twenty-nine and a half; ſo that it will be twenty-nine days and a half from conjunction to conjunction. And thus the wire *a* ſhifts over one day of the moon's age on the ſun-plate in twenty-four hours. The phaſes of the moon for every day of her age may be ſeen through a round hole *m* in the moon-plate: thus, at conjunction or new-moon, the whole ſpace ſeen through *m* is black; at oppoſition or full moon this ſpace is white; at either quadrature half black and half white; and at every poſition the white part reſembles the viſible part of the moon for every day of her age. The black ſhaded ſpace N *f* F *l* (fig. 8.) on the ſun-plate ſerves for theſe appearances. N repreſents the new moon, F the full moon, and *f* her firſt quarter, and *l* her laſt quarter, &c. The wheel-work and tide-work of this clock are repreſented in fig. 9. A and B are two wheels of equal diameters: A has fifty-ſeven teeth, with a hollow axis that paſſes through the dial of the clock, and carries the ſun-plate with the ſun S. B has fifty-nine teeth, with a ſolid ſpindle for its axis, which turns within the hollow axis of A, and carries the moon-plate with the moon M: both wheels are turned round by a pinion C of nineteen leaves, and this pinion is turned round by the common clock-work in eight hours; and as nineteen is the third part of fifty-ſeven, the wheel A will go round in twenty-four hours; and the wheel B in twenty-four hours fifty minutes and a half: fifty-ſeven being to twenty-four as fifty-nine to twenty-four hours fifty minutes and a half very nearly. On the back of the wheel B is fixed an elliptical ring D, which, in its revolution, raiſes and lets down a lever EF, whoſe centre of motion is on a pin at F; and this, by the upright bar G, raiſes and lets down the tide-plate H twice in the time of the moon's revolving from the meridian to the meridian again: this plate moves between four rollers R, R, R, R. A clock of this kind was adapted by Mr Ferguſon to the movement of an old watch: the great wheel of a watch goes round in four hours; on the axis of this he fixed a wheel of twenty teeth, to turn a wheel of forty teeth on the axis of the pinion C; by which means that pinion was turned round in eight hours, the wheel A in twenty-four, and the wheel B in twenty-four hours fifty minutes and a half.

To this article we ſhall ſubjoin a brief account of two curious contrivances. The firſt, for giving motion to the parts of a clock by making it to deſcend along an inclined plane, is the invention of Mr Maurice Wheeler; the clock itſelf was formerly ſeen in Don Saltero's coffee-houſe at Chelſea. DE, fig. 10. is the inclined plane on which the clock ABC deſcends; Plate CXLVIII. this conſiſts externally of a hoop about an inch broad, and two ſides or plates ſtanding out beyond the hoop about one-eighth of an inch all round, with indented edges, that the clock may not ſlide, but turn round whilſt it moves down. One of theſe plates is inſcribed with the twenty-four hours, which paſs ſucceſſively under the index LP, fig. 11. which is always in a poſition perpendicular to the horizon, and ſhows the hour on the top of the machine: for this reaſon the lower part of the index, or HL, is heavieſt, that it may preponderate the other HP, and always keep it pendulous, with its point to the vertical hour, as the movement goes on. Inſtead of this index, an image may be fixed for ornament on the axis *g*, which with an erected finger performs the office of an index. In order to deſcribe the internal part or mechaniſm of this clock, let LETQ be the external circumference of the hoop, and *ff* the ſame plate, on which is placed the train of wheel-work 1, 2, 3, 4, which is much the ſame as in other clocks, and is governed by a balance and regulator as in them. But there is no need of a ſpring and fuſee in this clock: their effects being otherwiſe anſwered as we ſhall ſee. In this machine the great wheel of 1 is placed in the centre, or upon the axis of the movement, and the other wheels and parts towards one ſide, which would therefore prove a bias to the body of the clock, and cauſe it to move, even on a horizontal plane, for ſome ſhort diſtance: this makes it neceſſary to fix a thin plate of lead at C, on the oppoſite part of the hoop, to reſtore the equilibrium of the movement. This being done, the machine will abide at reſt in any poſition on the horizontal plane HH; but if that plane be changed into the inclined plane DE, it will touch it in the point D; but it cannot reſt there, becauſe the centre of gravity at M acting in the direction MI, and the point T having nothing to ſupport it, muſt continually deſcend, and carry the body down the plane. But now if any weight P be fixed on the other ſide of the machine, ſuch as ſhall remove the centre of gravity from M to the point V in the line LD which paſſes through the point D, it will then reſt upon the inclined plane, as in the caſe of the rolling cylinder. If this weight P be ſuppoſed not fixed, but ſuſpended at the end of an arm, or vectis, which arm or lever is at the ſame time faſtened to a centrical wheel 1, moving on the axis M of the machine, which wheel by its teeth ſhall communicate with the train of wheels, &c. on the other ſide, and the power of the weight be juſt equal to the friction or reſiſtance of the train, it will remain motionleſs as it did before when it was fixed; and conſequently the clock alſo will be at reſt on the inclined plane. But ſuppoſing the power of the weight P to be ſuperior to the reſiſtance of the train, it will then put it into motion, and of courſe the clock likewiſe; which will then commence a motion down the plane; while the weight P, its vectis PM, and the wheel 1, all conſtantly retain the ſame poſition which they have at firſt when the clock begins to move. Hence it is eaſy to underſtand, that the weight P may have ſuch an intrinſic gravity as ſhall cauſe it to act upon the train with any required force, ſo as to produce a motion in the machine of any required velocity; ſuch, for inſtance, as ſhall carry it once round in twenty-four hours: then, if the diameters of the plates ABC be four inches, it will deſcribe the length of their circumference, viz. 12,56 inches, in one natural day; and therefore, if the plane be of a ſufficient breadth, ſuch a clock may go ſeveral days, and would furniſh a perpetual motion, if the plane were infinitely extended. Let SD be drawn through M perpendicular to the inclined plane in the point D; alſo let LD be perpendicular to the horizontal line HH, paſſing through D; then is the angle HDE=LDS=DMT; whence it follows that the greater the angle of the plane's elevation is, the greater will be the arch DT; and conſequently the further will the common centre of gravity be removed from M; therefore the power of P will be augmented, and of courſe the motion of the whole machine accelerated. Thus it appears, that by duly adjuſting the intrinſic weight of P, at firſt to produce a motion ſhowing the mean time as near as poſſible, the time may be afterwards corrected, or the clock made to go faſter or ſlower by raiſing or depreſſing the plane, by means of the ſcrew at S. The angle to which the plane is firſt raiſed is about ten degrees. The marquis of Worceſter is alſo ſaid to have contrived a watch that moved on a declivity. See farther *Phil. Tranſ. Abr.* vol. 1. p. 468, &c. or N° 161.

The other contrivance is that of M. de Gennes for making a clock aſcend on an inclined plane. To this end let ABC (fig. 12.) be the machine on the inclined plane EDE, and let it be kept at reſt upon it, or in equilibrio by the weight P at the end of the lever PM. The circular area CF is one end of a ſpring barrel in the middle of the movement, in which is included a ſpring as in a common watch. To this end of the barrel the arm or lever PM is fixed upon the centre M; and thus, when the clock is wound up, the ſpring moves the barrel, and therefore the lever and weight P in the ſituation PM. In doing this, the centre of gravity is conſtantly removed farther from the centre of the machine, and therefore it muſt determine the clock to move upwards, which it will continue to do as long as the ſpring is unbending itſelf; and thus the weight and its lever PM will preſerve the ſituation they firſt have, and to do the office of a chain and fuſee. *Phil. Tranſ.* N° 140. or Abridg. vol. i. p. 467.

By ſtat. 9 and 10 W. III. cap. 28. § [illegible]. no perſon ſhall export, or endeavour to export out of this kingdom,

dom, any outward or inward box-caſe or dial-plate, of gold, ſilver, braſs, or other metal, for clock or watch, without the movement in or with every ſuch box, &c. made up fit for uſe, with the maker's name engraven thereon; nor ſhall any perſon make up any clock or watch without putting his name and place of abode or freedom, and no other name or place, on every clock or watch; on penalty of forfeiting every ſuch box, caſe, and dial-plate, clock and watch, not made up and engraven as aforeſaid; and 20l. one moiety to the king, the other to thoſe that ſhall ſue for the ſame.

CLOCKS, *portable*, or *pocket*, commonly denominated *Watches*. See the article WATCH.

Clock-Work, properly ſo called, is that part of the movement which ſtrikes the hours, &c. on a bell; in contradiſtinction to that part of the movement of a clock or watch which is deſigned to meaſure and exhibit the time on a dial-plate, and which is termed *Watch-work*.

Plate CXLVIII. fig. 13.

I. Of the *Clock* part. The wheels compoſing this part are: The great or firſt wheel H, which is moved by the weight or ſpring at the barrel G: in ſixteen or thirty-hour clocks, this has uſually pins, and is called the *pin-wheel*; in eight-day pieces, the ſecond wheel I is commonly the pin-wheel, or ſtriking-wheel, which is moved by the former. Next the ſtriking wheel is the detent-wheel, or hoop-wheel K, having a hoop almoſt round it, wherein is a vacancy at which the clock locks. The next is the third or fourth wheel, according to its diſtance from the firſt, called the *warning-wheel* L. The laſt is the flying pinion Q, with a fly or fan, to gather air, and ſo bridle the rapidity of the clock's motion. To theſe muſt be added the pinion of report, which drives round the locking-wheel, called alſo the *count-wheel*; ordinarily with eleven notches in it, unequally diſtant, to make the clock ſtrike the hours.

Beſides the wheels, to the clock part belongs the raſh or ratch; a kind of wheel with twelve large fangs, running concentrical to the dial-wheel, and ſerving to lift up the detents every hour, and make the clock ſtrike: the detents or ſtops, which being lifted up and let fall, lock and unlock the clock in ſtriking; the hammer, as S, which ſtrikes the bell R; the hammer-tails, as T, by which the ſtriking pins draw back the hammers; latches, whereby the work is lifted up and unlocked: and lifting-pieces, as P, which lift up and unlock the detents.

The method of calculating the numbers of a piece of clock-work having ſomething in it very entertaining, and at the ſame time very eaſy and uſeful, we ſhall give our readers the rules relating thereto: 1. Regard here needs only be had to the counting-wheel, ſtriking-wheel, and detent-wheel, which move round in this proportion: the court-wheel commonly goes round once in 12 or 24 hours; the detent-wheel moves round every ſtroke the clock ſtrikes, or ſometimes but once in two ſtrokes: wherefore it follows, that, 2. As many pins as are in the pin-wheel, ſo many turns hath the detent-wheel in one turn of the pin-wheel; or, which is the ſame, the pins of the pin-wheel are the quotients of that wheel divided by the pinion of the detent-wheel. But if the detent-wheel moves but once round in two ſtrokes of the clock, then the ſaid quotient is but half the number of pins. 3. As many turns of the pin-wheel as are required to perform the ſtrokes of 12 hours (which are 78), ſo many turns muſt the pinion of report have to turn round the count-wheel once; or thus the quotient of 78, divided by the number of ſtriking-pins, ſhall be the quotient for the pinion of report and the count-wheel; and this is in caſe the pinion of report be fixed to the arbor of the pin-wheel, which is commonly done.

An example will make all plain: The locking-wheel being 48, the pinion of report 8, the pin-wheel 78, the ſtriking pins are 13, and ſo of the reſt. Note alſo, that 78 divided by 13 gives 6, the quotient of the pinion of report. As for the warning-wheel and fly-wheel, it matters little what numbers they have; their uſe being only to bridle the rapidity of the motion of the other wheels.

8) 48 (6.

6) 78 (13.
6) 60 (10.
6) 48 (8.

The following rules will be of great ſervice in this calculation. 1. *To find how many ſtrokes a clock ſtrikes in one turn of the fuſee or barrel:* As the turns of the great wheel or fuſee are to the days of the clock's continuance; ſo is the number of ſtrokes in 24 hours, viz. 156, to the ſtrokes of one turn of the fuſee.

2. *To find how many days a clock will go;* As the ſtrokes in 24 hours are to thoſe in one turn of the fuſee; ſo are the turns of the fuſee to the days of the clock's going.

3. *To find the number of turns of the fuſee or barrel:* As the ſtrokes in one turn of the fuſee are to thoſe of 24 hours; ſo is the clock's continuance to the turns of the fuſee or great wheel.

4. *To find the number of leaves in the pinion of report on the axis of the great wheel:* As the number of ſtrokes in the clock's continuance is to the turns of the fuſee; ſo are the ſtrokes in 12 hours, viz. 78, to the quotient of the pinion of report fixed on the arbor of the great wheel.

5. *To find the ſtrokes in the clock's continuance:* As 12 is to 78; ſo are the hours of the clock's continuance to the number of ſtrokes in that time.

By means of the following table, clocks and watches may be ſo regulated as to meaſure true equal time.

The ſtars make 366 revolutions from any point of the compaſs to the ſame point again in 365 days and one minute; and therefore they gain a 365th of a revolution every 24 hours of mean ſolar time, near enough for regulating any clock or watch.

This acceleration is at the rate of 3 min. 55 ſec. 53 thirds, 59 fourths in 24 hours; or in the neareſt round numbers, 3 minutes, 56 ſeconds; by which quantity of time every ſtar comes round ſooner than it did on the day before.

Therefore if you mark the preciſe moment ſhown by a clock or watch when any ſtar vaniſhes behind a chimney, or any other object, as ſeen through a ſmall hole in a thin plate of metal, fixed in a window-ſhutter;

Days.	H.	M.	S.
1	0	3	56
2	0	7	52
3	0	11	48
4	0	15	44
5	0	19	40
6	0	23	36
7	0	27	32
8	0	31	28
9	0	35	24
10	0	39	20
11	0	43	16
12	0	47	12
13	0	51	8
14	0	55	4
15	0	59	0
16	1	2	56
17	1	6	52

Days.	H.	M.	S.
18	1	10	48
19	1	14	44
20	1	18	40
21	1	22	36
22	1	26	32
23	1	30	28
24	1	34	24
25	1	38	20
26	1	42	16
27	1	46	12
28	1	50	8
29	1	54	4
30	1	58	0

and do this for ſeveral nights ſucceſſively (as ſuppoſe twenty); if, at the end of that time, the ſtar vaniſhes as much ſooner than it did the firſt night, by the clock, as anſwers to the time denoted in the table for ſo many days, the clock goes true; otherwiſe not. If the difference between the clock and ſtar be leſs than the table ſhews, the clock goes too faſt; if greater, it goes too ſlow; and muſt be regulated accordingly, by letting down or raiſing up the ball of the pendulum, by little and little, by turning the ſcrew-nut under the ball, till you find it keeps true equal time.

Thus ſuppoſing the ſtar ſhould diſappear behind a chimney, any night when it is XII. by the clock; and that, on the 20th night afterward, the ſame ſtar ſhould diſappear when the time is 41 minutes 22 ſeconds paſt X, by the clock; which being ſubtracted from 12 hours 0 min. 0 ſec. leaves remaining 1 hour 18 minutes 40 ſeconds for the time the ſtar is then faſter than the clock: look in the table, and againſt 20, in the left-hand column, you will find the acceleration of the ſtar to be 1 hour 18 min. 40 ſec. agreeing exactly with what the difference ought to be between the clock and ſtar; which ſhows that the clock meaſures true equal time, and agrees with the mean ſolar time, as it ought to do.

II. Of the *Watch* part of a clock or watch. This is that part of the movement which is deſigned to meaſure and exhibit the time on a dial-plate; in contradiſtinction to that part which contributes to the ſtriking of the hour, &c.

The ſeveral members of the watch-part are, 1. The balance, conſiſting of the rim, which is its circular part; and the verge, which is its ſpindle; to which belong two palettes or leaves, that play in the teeth of the crown-wheel. 2. The potence, or pottance, which is the ſtrong ſtud in pocket-watches, whereon the lower pivot of the verge plays, and in the middle of which one pivot of the balance-wheel plays; the bottom of the pottance is called the foot, the middle part the noſe, and the upper part the ſhoulder. 3. The cock, which is the piece covering the balance. 4. The regulator, or pendulum ſpring, which is the ſmall ſpring, in the new pocket-watches, underneath the balance. 5. The pendulum (fig. 13.); whoſe parts are, the verge *x*, palettes 5, 5, cocks *yyy*, the rod, the fork, *z*, the flatt 2, the bob or great ball 3, and the corrector or regulator, 4, being a contrivance of Dr Derham for bringing the pendulum to its nice vibrations. 6. The wheels, which are the crown-wheel F in pocket-pieces, and ſwing-wheel in pendulums; ſerving to drive the balance or pendulum. 7. The contrate-wheel E, which is that next the crown-wheel, &c. and whoſe teeth and hoop lie contrary to thoſe of other wheels; whence the name. 8. The great, or firſt wheel C; which is that the fuſee B, &c. immediately drives, by means of the chain or ſtring of the ſpring-box or barrel A; after which are the ſecond wheel D, third wheel, &c. Laſtly, between the frame and dial-plate, is the pinion of report, which is that fixed on the arbor of the great wheel; and ſerves to drive the dial-wheel, as that ſerves to carry the hand.

For the illuſtration of this part of the work which lies concealed, let ABC (fig. 12.) repreſent the uppermoſt ſide of the frame-plate, as it appears when detached from the dial-plate: the middle of this plate is perforated with a hole, receiving that end of the arbor of the centre wheel which carries the minute hand; near the plate is fixed the pinion of report *a b* of 10 teeth; this drives a wheel *c d* of 40 teeth; this wheel carries a pinion *e f* of 12 teeth; and this again drives a wheel *g h* with 36 teeth.

As in the body of the watch the wheels every where divide the pinions; here, on the contrary, the pinions divide the wheels, and by that means diminiſh the motion, which is here neceſſary; for the hour hand, which is carried on a ſocket fixed on the wheel *g h*, is required to move but once round, while the pinion *a b* moves twelve times round. For this purpoſe the motion of the wheel *c d* is $\frac{1}{4}$ of the pinion *a b*. Again, while the wheel *c d*, or the pinion *e f*, goes once round, it turns the wheel *g h* but $\frac{1}{3}$ part round; conſequently the motion of *g h* is but $\frac{1}{3}$ of $\frac{1}{4}$ of the motion of *a b*; but $\frac{1}{3}$ of $\frac{1}{4}$ is $\frac{1}{12}$; *i. e.* the hour-wheel *g h* moves once round in the time that the pinion of report, on the arbor of the centre of the minute wheel, makes 12 revolutions, as required. Hence the ſtructure of that part of a clock or watch which ſhows the time may be eaſily underſtood.

The cylinder A (fig. 13.) put into motion by a weight or incloſed ſpring moves the fuſee B, and the great wheel C, to which it is fixed by the line or cord that goes round each, and anſwers to the chain of a watch.

The method of calculation is eaſily underſtood by the ſequel of this article; for, ſuppoſe the great wheel C goes round once in 12 hours, then if it be a royal pendulum clock, vibrating ſeconds, we have $60 \times 60 \times 12 = 43200$ ſeconds or beats in one turn of the great wheel. But becauſe there are 60 ſwings or ſeconds in one minute, and the ſeconds are ſhown by an index on the end of the arbor of the ſwing-wheel, which in thoſe clocks is in an horizontal poſition; therefore, it is neceſſary that the ſwing-wheel F ſhould have 30 teeth; whence $\frac{43200}{60} = 720$, the number to be broken into quotients for finding the number of teeth for the other wheels and pinions.

In ſpring-clocks, the diſpoſition of the wheels in the watch part is ſuch as is here repreſented in the figure, where the crown-wheel F is in an horizontal poſition; the ſeconds not being ſhown there by an index, as is done in the large pendulum clocks. Whence in theſe clocks the wheels are diſpoſed in a different manner, as repreſented in fig. 14. where C is the great wheel, and D the centre or minute wheel, as before: but the contrate wheel E is placed on one ſide, and F the ſwing-wheel is placed with its centre in the ſame perpendicular line GH with the minute-wheel, and with its plane perpendicular to the horizon, as are all the others. Thus the minute and hour hands turn on the end of the arbor of the minute-wheel at *a*, and the ſecond hand on the arbor of the ſwing-wheel at *b*.

Theory and calculation of the Watch-part, as laid down by *by the Rev. Dr Derham.*—1. The ſame motion, it is evident, may be performed either by one wheel and one pinion, or many wheels and many pinions; provided the number of turns of all the wheels bear the proportion to all the pinions which that one wheel bears to its pinion: or, which is the ſame thing, if the number produced by multiplying all the wheels together be to the number produced by multiplying all the pinions together, as that one wheel to that one pinion. Thus, ſuppoſe you had occaſion for a wheel of 1440 teeth, with a pinion of 28 leaves; you make it into three wheels of 36, 8, and 5, and three pinions of 4, 7, and 1. For the three wheels, 36, 8, and 5, multiplied together, give 1440 for the wheels, and the three pinions, 4, 7, and 1, multiplied together, give 28 for the pinions. Add, that it matters not in what order the wheels and pinions are ſet, or which pinion runs in which wheel; only, for convenience ſake, the biggeſt numbers are commonly put to drive the reſt.

2. Two wheels and pinions of different numbers may perform the ſame motion. Thus, a wheel of 36 drives a pinion of 4; the ſame as a wheel of 45 a pinion of 5; or a wheel of 90 a pinion of 10; the turns of each being 9.

3. If, in breaking the train into parcels, any of the quotients ſhould not be liked; or if any other two numbers, to be multiplied together, are deſired to be varied, it may be done by this rule. Divide the two numbers by any other two numbers which will meaſure them; multiply the quotients by the alternate diviſors; the product of theſe two laſt numbers found will be equal to the product of the two numbers firſt given. Thus, if you would vary 46 times 8, divide theſe by any two numbers which will evenly meaſure them: ſo, 36 by 4 gives 9; and 8 by 1 gives 8; now, by the rule, 9 times 1 is 9, and 8 times 4 is 32; ſo that for 36+8, you have 32+9; each equal to 288. If you divide 36 by 6, and 8 by 2, and multiply as before, you have 24+12=36+8=288.

4. If a wheel and pinion fall out with croſs numbers, too big to be cut in wheels, and yet not to be altered by theſe rules; in ſeeking for the pinion of report, find two numbers of the ſame, or a near proportion, by this rule: as either of the two given numbers is to the other, ſo is 360 to a fourth. Divide that fourth number, as alſo 360, by 4, 5, 6, 8, 9, 10, 12, 15 (each of which numbers exactly meaſures 360), or by any of thoſe numbers that bring a quotient neareſt to an integer. As ſuppoſe you had 147 for the wheel, and 170 for the pinion; which are too great to be cut into ſmall wheels, and yet cannot be reduced into leſs, as having no other common meaſure but unity; ſay, as 170 : 147 : : 360 : 311. Or, as 147 : 170 : : 360 : 416. Divide the fourth number and 360 by one of the foregoing numbers; as 311 and 360 by 6, it gives 52 and 60; divide them by 8, you have 39 and 45; and if you divide 360 and 416 by 8, you have 45 and 52 exactly. Wherefore, inſtead of the two numbers 147 and 170, you may take 52 and 60, or 39 and 45, or 45 and 52, &c.

5. To come to practice in calculating a piece of watch-work: Firſt pitch on the train or beats of the balance in an hour; as, whether a ſwift one of about 20,000 beats (the uſual train of a common 30 hour pocket-watch), or a ſlower of about 16,000 (the train of the new pendulum pocket-watches), or any other train. Next, reſolve on the number of turns the fuſee is intended to have, and the number of hours the piece is to go: ſuppoſe, e. gr. 12 turns, and to go 30 hours, or 192 hours (i. e. 8 days), &c. Proceed now to find the beats of the balance or pendulum in one turn of the fuſee; thus in numbers; 12 : 16 : : 20,000 : 26666. Wherefore, 26666 are the beats in one turn of the fuſee or great wheel, and are equal to the quotients of all the wheels unto the balance multiplied together. Now this number is to be broken into a convenient parcel of quotients; which is to be done thus: firſt, halve the number of beats, viz. 26666, and you have 13333; then pitch on the number of the crown-wheel, ſuppoſe 17: divide 13333 by 17, and you have 784 for the quotient (or turns) of the reſt of the wheels and pinions; which, being too big for one or two quotients, may be beſt broken into three. Chooſe therefore three numbers; which, when multiplied all together continually, will come neareſt 784: as ſuppoſe 10, 9, and 9, multiplied continually, give 810, which is ſomewhat too much; therefore try again other numbers, 11, 9, 8: theſe, drawn one into another continually, produce 792; which is as near as can be, and is a convenient quotient. Having thus contrived the piece from the great wheel to the balance, but the numbers not falling out exactly, as you firſt propoſed, correct the work thus: firſt multiply 792, the product of all the quotients pitched upon, by 17 (the notches of the crown-wheel); the product is 13464, which is half the number of beats in one turn of the fuſee: Then find the true number of beats in an hour. Thus, 16 : 12 : : 13464 : 10098, which is half the beats in an hour. Then find what quotient is to be laid upon the pinion of report (by the rule given under that word). Thus, 16 : 12 : : 12 : 9, the quotient of the pinion of report. Having thus found your quotients, it is eaſy to determine what numbers the wheels ſhall have, for chooſing what numbers the pinions ſhall have, and multiplying the pinions by their quotients, the product is the number for the wheels. Thus, the number of the pinion of report is 4, and its quotient is 9; therefore the number for the dial-wheel muſt be 4×9, or 36: ſo the next pinion being 5, its quotient 11, therefore the great wheel muſt be 5×11=55; and ſo of the reſt.

4) 36 (9

5) 55 (11
5) 45 (9
5) 40 (8

17

Such is the method of calculating the numbers of a 16 hour watch. Which watch may be made to go longer by leſſening the train, and altering the pinion of report. Suppoſe you could conveniently ſlacken the train to 16000; then ſay, As $\frac{1}{2}$ 16000, or 8000 : 13464 : : 12 : 20; ſo that this watch will go 20 hours. Then, for the pinion of report, ſay (by the rule given under that word), as 20 : 12 : : 12 : 7. So that 7 is the quotient of the pinion of report. And as to the numbers, the operation is the ſame as before, only the dial-wheel is but 28; for its quotient is altered to 7. If you would give numbers to a watch of about 10,000 beats in an hour, to have 12 turns of the fuſee, to go 170 hours, and 17 notches in the crown-wheel; the work

4) 28 (7

5) 55 (11
5) 45 (9
5) 40 (8

17

is the ſame, in a manner, as in the laſt example: and conſequently thus: as 12 : 170 :: 10000 : 141666, which fourth number is the beats in one turn of the fuſee; its half, 70833, being divided by 17, gives 4167 for the quotient; and becauſe this number is too big for three quotients, therefore chooſe four, as 10, 8, 8, 6⅗; whoſe product into 17 makes 71808, nearly equal to half the true beats in one turn of the fuſee. Then ſay, as 170 : 12 : 71808 : 5069, which is half the true train of your watch. And again, 170 : 12 :: 12 : $\frac{144}{170}$, the denominator of which expreſſes the pinion of report, and the numerator is the number of the dial-wheel. But theſe numbers being too big to be cut in ſmall wheels, they muſt be varied by the fourth rule above. Thus:

As 44 : 170 :: 360 : 425 :
Or 170 : 144 :: 360 : 305.

Then dividing 360, and either of theſe two-fourth proportionals (as directed by the rule), ſuppoſe by 15; you will have $\frac{24}{28}$ or $\frac{20}{24}$; then the numbers of the whole movement will ſtand as in the margin.

24) 20 ($\frac{20}{24}$
———
6) 60 (10
6) 48 (8
5) 40 (8
5) 33 (6⅗
———
17

Such is the calculation of ordinary watches, to ſhow the hour of the day: in ſuch as ſhow minutes, and ſeconds, the proceſs is thus:

1. Having reſolved on the beats in an hour, by dividing the deſigned train by 60, find the beats in a minute; and accordingly, find proper numbers for the crown-wheel and quotients, ſo as that the minute-wheel ſhall go round once in an hour, and the ſecond wheel once in a minute.

Suppoſe, you ſhall chooſe a pendulum of ſeven inches, which vibrates 142 ſtrokes in a minute, and 8520 in an hour. Half theſe ſums are 71, and 4260. Now, the firſt work is to break this 71 into a good proportion, which will fall into one quotient, and the crown-wheel. Let the crown-wheel have 15 notches; then 71, divided by 15, gives nearly 5; ſo a crown-wheel of 15, and a wheel and pinion whoſe quotient is 5, will go round in a minute to carry a hand to ſhow ſeconds. For a hand to go round in an hour to ſhow minutes, becauſe there are 60 minutes in an hour, it is but breaking 60 into good quotients (ſuppoſe 10 and 6, or 8 and 7½, &c.): and it is done. Thus, 4260 is broken as near as can be into proper numbers. But ſince it does not fall out exactly into the above-mentioned numbers, you muſt correct (as before directed), and find the true number of beats in an hour, by multiplying 15 by 5, which makes 75; and 75 by 60 makes 4500, which is half the true train. Then find the beats in one turn of the fuſee; thus, 16 : 192 :: 4500 : 54000; which laſt is half the beats in one turn of the fuſee. This 54000 being divided by 4500 (the true numbers already pitched on), the quotient will be 1; which, not being too big for a ſingle quotient, needs not be divided into more; and the work will ſtand as in the margin. As to the hour-hand, the great wheel, which performs only one revolution in 12 turns of the minute-wheel, will ſhow the hour; or it may be done by the minute-wheel.

8) 40 (5
———
15

8) 64 (8
8) 60 (7½
8) 40 (5
———
15

0) 108 (12
8) 64 (8
8) 60 (7½
8) 40 (5
———
15

It is requiſite for thoſe who make nice aſtronomical obſervations, to have watches that make ſome exact number of beats per ſecond, without any fraction; but we ſeldom find a watch that does. As four beats per ſecond would be a very convenient number, we ſhall here give the train for ſuch a watch, which would (like moſt others) go 30 hours, but is to be wound up once in 24 hours.

The fuſee and firſt wheel to go round in four hours. This wheel has 48 teeth, and it turns a pinion of 12 leaves, on whoſe axis is the ſecond wheel, which goes round in one hour, and carries the minute-hand. This wheel has 60 teeth, and turns a pinion of 10 leaves; on whoſe axis is the third wheel of 60 teeth, turning a pinion of 6 leaves; on whoſe axis is the fourth (or contrate) wheel, turning round in a minute, and carrying the ſmall hand that ſhows the ſeconds, on a ſmall circle on the dial-plate, divided into 60 parts: this contrate wheel has 48 teeth, and turns a pinion of 6 leaves; on whoſe axis is the crown or balance-wheel of 15 teeth, which makes 30 beats in each revolution.

The crown-wheel goes 480 times round in an hour, and 30 times 480 make 14400, the number of beats in an hour. But one hour contains 3600 ſeconds; and 14400 divided by 3600 quotes 4, the required number of beats in a ſecond.

The fuſee muſt have 7½ turns, to let the chain go ſo many times round it. Then, as 1 turn is to 4 hours, ſo is 7½ turns to 30 hours, the time the watch would go after it is wound up.

See further the articles MOVEMENT, TURN, &c. And for the hiſtory and particular conſtruction of *Watches*, properly ſo called, ſee the article WATCH.

CLODIA LEX, *de Cypro*, was enacted by the tribune Clodius, in the year of Rome 607, to reduce Cyprus into a Roman province, and expoſe Ptolemy king of Egypt to ſale in his regal ornaments. It empowered Cato to go with the prætorean power and ſee the auction of the king's goods, and commiſſioned him to return the money to Rome. Another, *de Magiſtratibus*, 695, by Clodius the tribune. It forbade the cenſors to put a ſtigma or mark of infamy upon any perſon who had not been actually accuſed and condemned by both the cenſors. Another, *de Religione*, by the ſame, 696, to deprive the prieſt of Cybele, a native of Peſſinuns, of his office, and confer the prieſthood upon Brotigonus, a Gallogrecian. Another, *de Provinciis*, 695, which nominated the provinces of Syria, Babylon, and Perſia, to the conſul Gabinus, and Achaia, Theſſaly, Macedon, and Greece, to his colleague Piſo, with proconſular power. It empowered them to defray the expences of their march from the public treaſury. Another, 695, which required the ſame diſtribution of corn among the people gratis, as had been given them before at ſix aſſes and a triens the buſhel. Another, 695, by the ſame, *de Judiciis*. It called to an account ſuch as had executed a Roman citizen without a judgment of the people and all the formalities of a trial. Another, by the ſame, to pay no attention to the appearances of the heavens while any affair was before

Fig. 3.

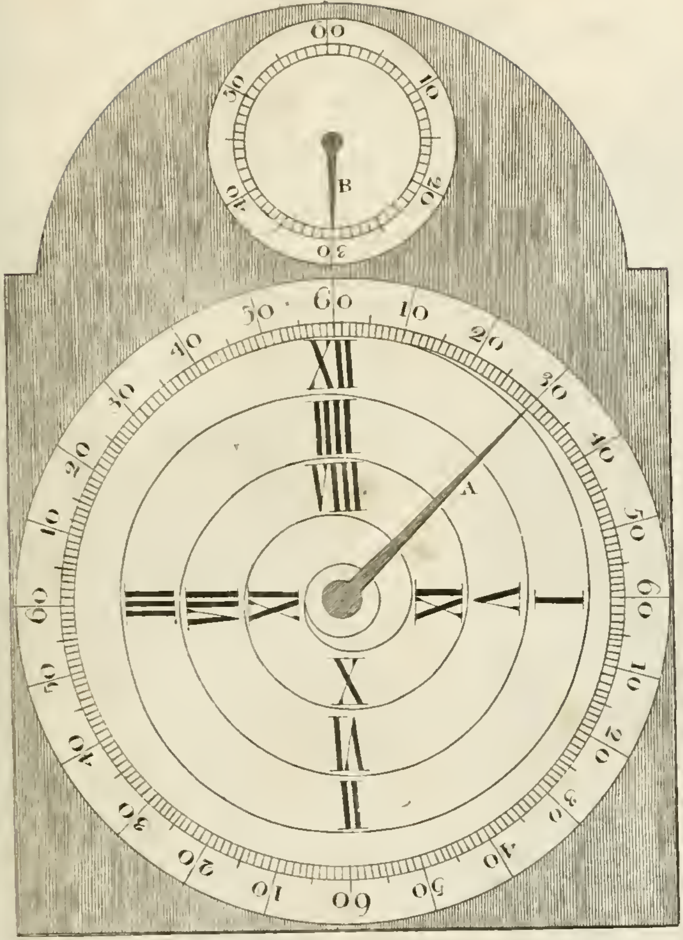


Fig. 1.

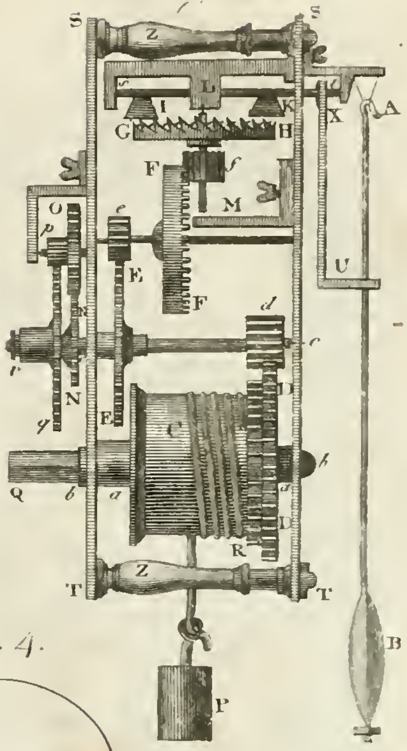


Fig. 4.

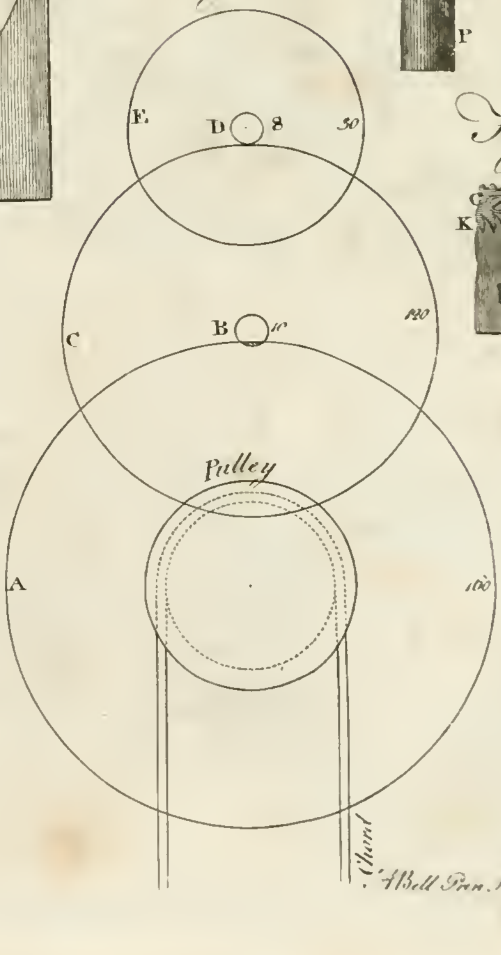
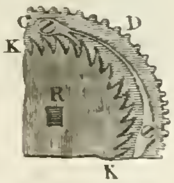


Fig. 2.



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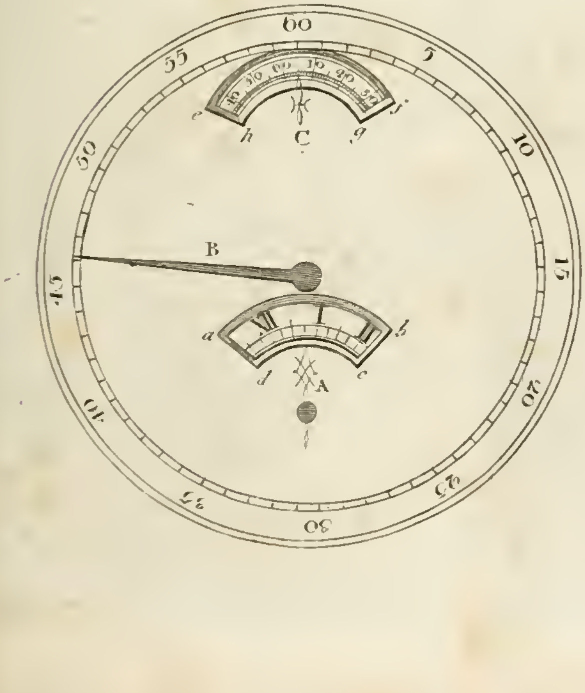
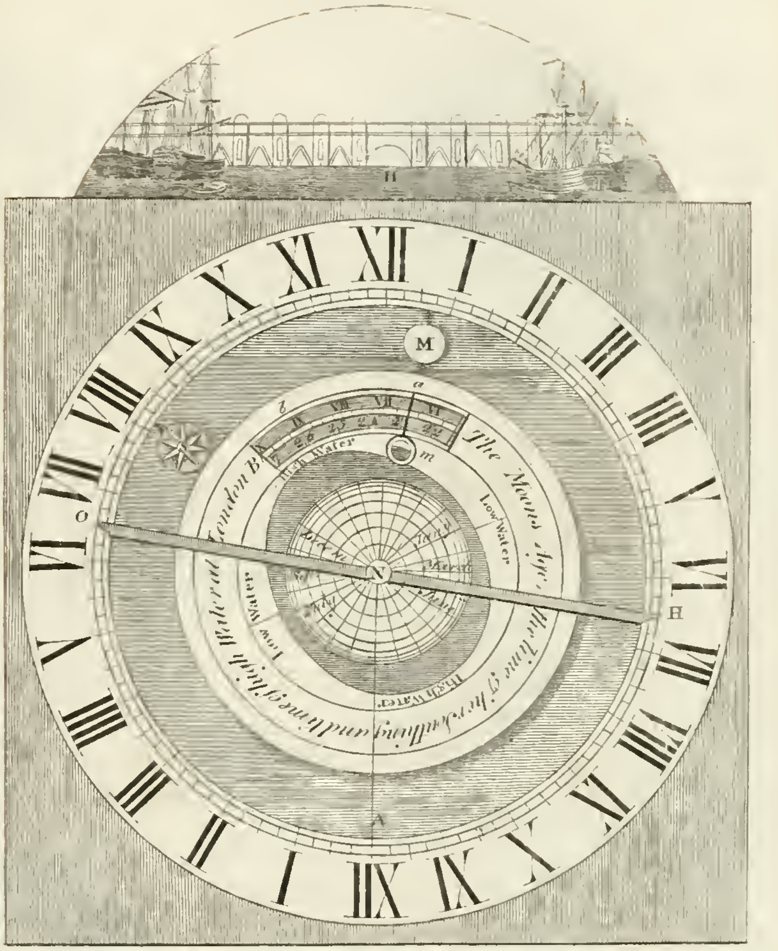


A Bell Prin. Wal. Sculptor fecit.

Fig. 7.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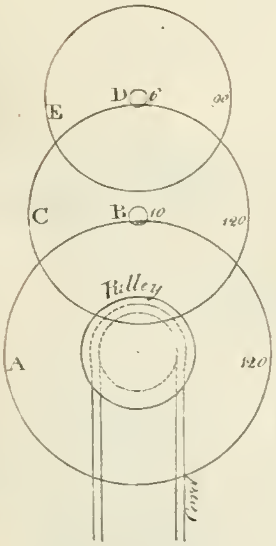


Fig. 9.

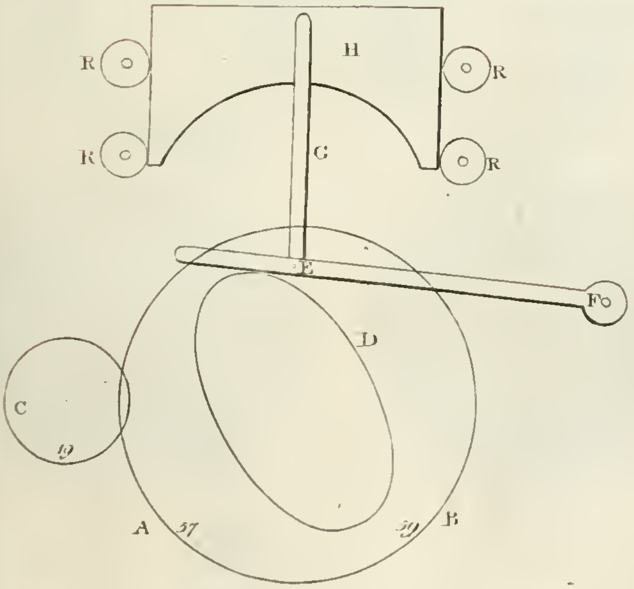
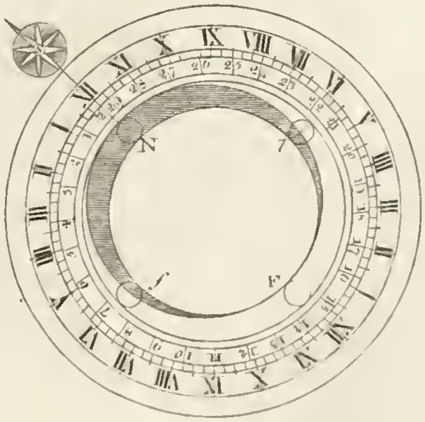


Fig. 8.



A. Bell Prin. Wal. Sculptor fecit.

Fig. 14.

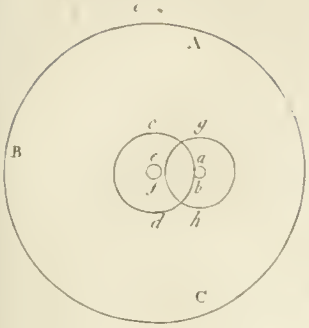


Fig. 10.

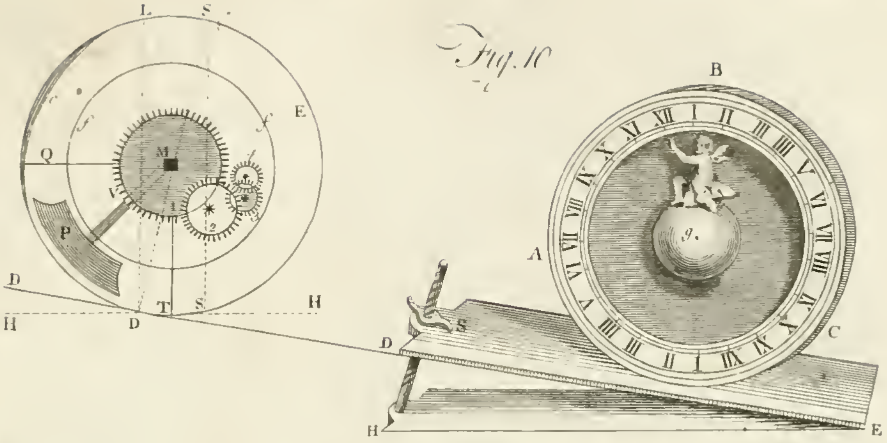


Fig. 13.

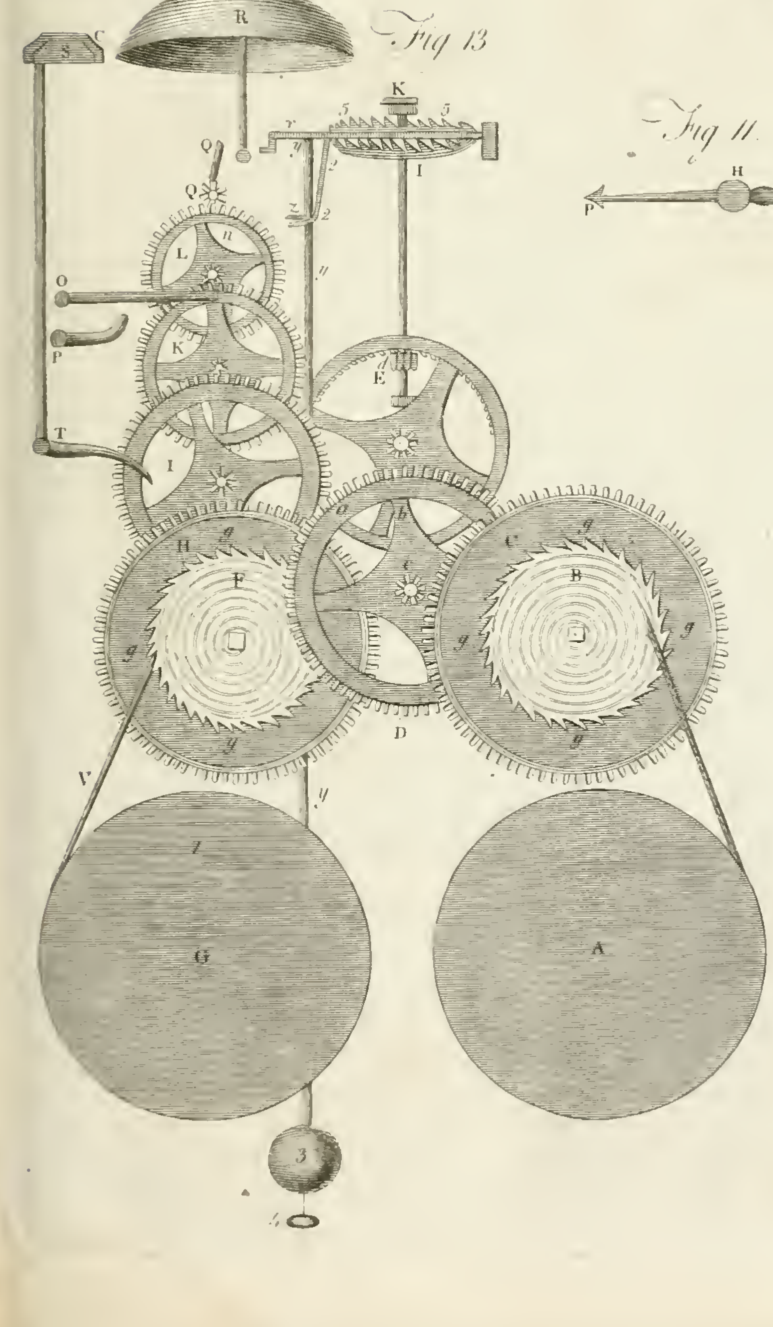


Fig. 11.

Fig. 12.

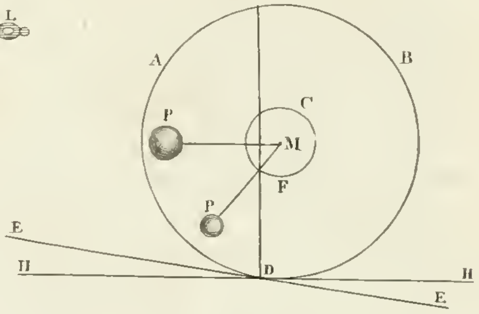
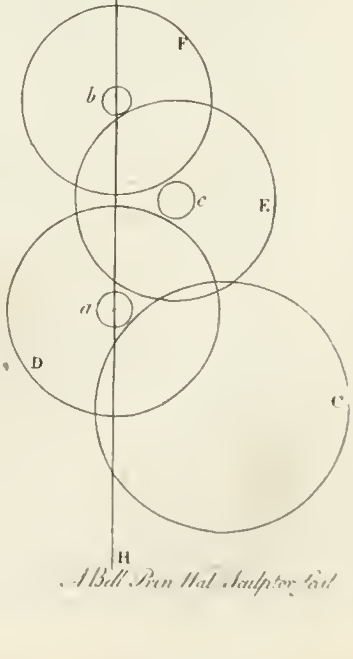


Fig. 15.



A Bell Prin Hal Sculptor fecit

fore the people. Another, to make the power of the tribunes free in making and propoſing laws. Another, to re-eſtabliſh the companies of artiſts which had been inſtituted by Numa, but ſince his time aboliſhed.

CLODIUS, Publius, a Roman deſcended of an illuſtrious family. He made himſelf famous for his licentiouſneſs, avarice, and ambition. He committed inceſt with his three ſiſters, and introduced himſelf in women's clothes into the houſe of Julius Cæſar, whilſt Pompeia Cæſar's wife, of whom he was enamoured, was celebrating the myſteries of Ceres, where no man was permitted to appear. He was accuſed for this violation of human and divine laws; but he made himſelf tribune, and by that means ſcreened himſelf from juſtice. He deſcended from a patrician into a plebeian family to become a tribune. He was ſuch an enemy to Cato, that he made him go with prætorian power, in an expedition againſt Ptolemy king of Cyprus, that by the difficulty of the campaign he might ruin his reputation, and deſtroy his intereſt at Rome during his abſence. Cato, however, by his uncommon ſucceſs, fruſtrated the deſigns of Clodius. He was alſo an inveterate enemy to Cicero, and by his influence he baniſhed him from Rome, partly on pretence that he had puniſhed with death and without trial the adherents of Catiline. He wreaked his vengeance upon Cicero's houſe, which he burnt, and ſet all his goods to ſale; which, however, to his great mortification, no one offered to buy. In ſpite of Clodius, Cicero was recalled, and all his goods reſtored to him. Clodius was ſome time after murdered by Milo, whoſe defence Cicero took upon himſelf.

CLOGHER, an epiſcopal town of Ireland, in the county of Tyrone, and province of Ulſter. It ſends two members to parliament. In a very early age an abbey of regular canons, dedicated to the Virgin Mary, was founded here. St Patrick is ſaid to have preſided over the church of Clogher; and having appointed St Kertenn to be his ſucceſſor, he reſigned this government, and went to Armagh, where he founded his celebrated abbey. On the 20th of April 1396, a dreadful fire burnt to the ground the church, the two chapels, the abbey, the court of the biſhops, and thirty-two other buildings, with all the ſacerdotal veſtments, utenſils, &c. belonging to the biſhop's chapter and church. In the year 1610, on the 24th of July, whilſt George Montgomery was biſhop of Clogher, King James annexed this abbey and its revenues to that fee. The fee (valued in the king's books at 350l. *per annum* by extent returned 15th James I.) is reputed to be worth 4000l. annually. W. Long. 6. 50. N. Lat. 54. 30.

CLOISTER (*Clauſtrum*), a habitation ſurrounded with walls, and inhabited by canons or religious, &c. In a more general ſenſe, cloiſter is uſed for a monaſtery of religious of either ſex. In a more reſtrained ſenſe, cloiſter is uſed for the principal part of a regular monaſtery, conſiſting of a ſquare built around; ordinarily between the church, the chapter-houſe, and the refectory; and over which is the dormitory. The cloiſters ſerved for ſeveral purpoſes in the ancient monaſteries. Petrus Bleſenſis obſerves, that it was here the monks held their lectures: the lecture of morality at the north ſide, next the church; the ſchool on the weſt, and the chapter on the eaſt; ſpiritual meditation, &c. being reſerved for the church. Lanfranc obſerves, that the proper uſe of the cloiſter was for the monks to meet in, and converſe together, at certain hours of the day.

The form of the cloiſter was ſquare; and it had its name *clauſtrum*, from *claudo*, "I ſhut or cloſe;" as being incloſed on its four ſides with buildings. Hence in architecture, a building is ſtill ſaid to be in form of a cloiſter, when there are buildings on each of the four ſides of the court

CLONMELL, the aſſize town of the county of Tipperary in Ireland, is ſituated on the river Suir, hath a barrack for two troops of horſe, and is governed by a mayor, recorder, bailiffs, and town-clerk The river is navigable from this town to Carrick and Waterford; and there is ſome trade carried on here in the woollen branch, particularly by the Quakers, who are very numerous in this neighbourhood. There is a ſpring here of Spa water, that iſſues out of the ſide of a riſing ground, that is, notwithſtanding, overlooked by a pretty ſteep hill, on that ſide of the river Suir which is in the county of Waterford. The cures performed by drinking this water in the ſcurvy, and other chronic diſtempers, drew thither, ſome years ago, a great reſort of people; but faſhion, which reigns with an abſolute authority, has brought other waters of late into higher credit. It was in this town that the celebrated and reverend Laurence Sterne was born, on the 24th of November 1713. The town conſiſts of four croſs ſtreets, and has a ſpacious bridge of 20 arches over the river Suir; the market-houſe is ſtrong and well built, and there is a charter-ſchool here for forty children, to which the late John Dawſon, Eſq; and Sir Charles Moore, Bart. were conſiderable benefactors. A Dominican friary was founded at Clonmell, in 1269, and dedicated to St Dominick. In the ſame year Otho de Grandiſon erected one of the moſt magnificent in Ireland. In it was kept an image of St Francis, reſpecting the miracles wrought by which, many marvellous ſtories are circulated. This town is very ancient, being built before the invaſion of the Danes: it was formerly defended by a ſquare wall. Oliver Cromwell, who found more reſiſtance from this place than any other of his conqueſts in the kingdom, demoliſhed the caſtles and fortifications, of which now only the ruins remain: the chief Gothic church here is ſtill kept in good repair. W. Long. 7. 27. N. Lat. 54. 14.

CLOSE, in *Heraldry*. When any bird is drawn in a coat of arms with its wings cloſe down about it, (i. e not diſplayed), and in a ſtanding poſture, they blazon it by this word *cloſe*; but if it be flying, they call it *volant*. See Volant.

Close, in *Muſic*. See Cadence.

Close-hauled in *Navigation*, the general arrangement or trim of a ſhip's ſails when ſhe endeavours to make a progreſs in the neareſt direction poſſible towards that point of the compaſs from which the wind blows. In this manner of ſailing, the keel commonly makes an angle of ſix points with the line of the wind; but ſloops and ſome other ſmall veſſels are ſaid to ſail almoſt a point nearer. All veſſels, however, are ſuppoſed to make nearly a point of leeway when cloſe-hauled, even when they have the advantage of a good ſailing breeze and ſmooth water. The angle of lee-way, however, increaſes in proportion to the increaſe of the wind and ſea. In this diſpoſition of the ſails, they are all extended ſidewiſe on the ſhip, ſo that the wind as it croſſes the ſhip obliquely toward the ſtern from forwards, may fill their cavities. But as the current of winds alſo enters the ſails in an oblique direction, the effort of it to make the ſhip advance is conſiderably diminiſhed: ſhe will therefore make the leaſt progreſs when ſailing in this manner. The ſhip is ſaid to be cloſe-hauled, becauſe at this time her *tacks*, or lower corners of the principal ſails, are drawn cloſe down to her ſide to windward, the ſheets hauled cloſe-aft, and all the bow-lines drawn to their greateſt extenſion to keep the ſails ſteady.

CLOSE-Quarters, certain ſtrong barriers of wood, ſtretching acroſs a merchant-ſhip in ſeveral places. They are uſed as places of retreat when a ſhip is boarded by her adverſary, and are therefore fitted with ſeveral ſmall loop holes through which to fire the ſmall arms, and thereby annoy the enemy and defend themſelves. They are likewiſe furniſhed with ſeveral caiſons called *powder-cheſts*, which are fixed upon the deck, and filled with powder, old-nails, &c. and may be fired at any time from the cloſe-quarters upon the boarders.

Falconer's Dict. of the Marine.

We have known an Engliſh merchant-ſhip of 16 guns, and properly fitted with cloſe-quarters, defeat the united efforts of three French privateers who boarded her in the laſt war, after having engaged at ſome diſtance nearly a day and a half, with very few intervals of reſt. Two of the cruiſers were equipped with twelve guns each, and the other with eight. The French ſailors were, after boarding, ſo much expoſed to continued fire of muſquetry and coehorns charged with granadoes, that a dreadful ſcene of carnage enſued, in which the decks were ſoon covered with the dead bodies of the enemy, ſeveral of which the boarders, in their hurry to eſcape, had left behind.

CLOT-BIRD: a ſpecies of FRINGILLA. See ORNITHOLOGY *Index*.

CLOTH, in commerce, a manufacture made of wool, wove in the loom.

Cloths are of divers qualities, fine or coarſe. The goodneſs of cloth, according to ſome, conſiſts in the following particulars: 1. That the wool be of a good quality, and well dreſſed. 2. It muſt be equally ſpun, carefully obſerving that the thread of the warp be finer and better twiſted than that of the woof. 3. The cloth muſt be well wrought, and beaten on the loom, ſo as to be everywhere equally compact. 4. The wool muſt not be finer at one end of the piece than in the reſt. 5. The liſts muſt be ſufficiently ſtrong, of the ſame length with the ſtuff, and muſt conſiſt of good wool, hair, or oſtrich-feathers; or, what is ſtill better, of Daniſh dog's hair. 6. The cloth muſt be free from knots and other imperfections. 7. It muſt be well ſcoured with fuller's earth, well fulled with the beſt white ſoap, and afterwards waſhed in clear water. 8. The hair or nap muſt be well drawn out without the teazel, without being too much opened. 9. It muſt be ſhorn cloſe without making it threadbare. 10. It muſt be well dried. 11. It muſt not be tenter-ſtretched, to force it to its juſt dimenſions. 12. It muſt be preſſed cold, not hot-preſſed, the latter being very injurious to woollen cloth.

Manufacturing of white Cloths which are intended for dyeing. The beſt wool for the manufacturing of cloths are thoſe of England and Spain, eſpecially thoſe of Lincolnſhire and Segovia. To uſe thoſe wools to the beſt advantage, they muſt be ſcoured, by putting them into a liquor ſomewhat more than lukewarm, compoſed of three parts fair water and one of urine. After the wool has continued long enough in the liquor to ſoak, and diſſolve the greaſe, it is drained and well waſhed in running water. When it feels dry, and has no ſmell but the natural one of the ſheep, it is ſaid to be duly ſcoured.

After this, it is hung to dry in the ſhade; the heat of the ſun making it harſh and inflexible: when dry, it is beat with rods upon hurdles of wood, or on cords, to cleanſe it from duſt and the groſſer filth; the more it is thus beat and cleanſed, the ſofter it becomes, and the better for ſpinning. After beating, it muſt be well picked, to free it from the reſt of the filth that had eſcaped the rods.

It is now in a proper condition to be oiled, and carded on large iron cards placed ſlopewiſe. Olive oil is eſteemed the beſt for this purpoſe; one-fifth of which ſhould be uſed for the wool intended for the woof, and a ninth for that deſigned for the warp. After the wool has been well oiled, it is given to the ſpinners, who firſt card it on the knee, with ſmall fine cards, and then ſpin it on the wheel, obſerving to make the thread of the warp ſmaller by one-third than that of the woof, and much compacter twiſted.

The thread thus ſpun, is reeled, and made into ſkeins. That deſigned for the woof is wound on little tubes, pieces of paper, or ruſhes, ſo diſpoſed as that they may be eaſily put in the eye of the ſhuttle. That for the warp is wound on a kind of large wooden bobbins, to diſpoſe it for warping. When warped, it is ſtiffened with ſize; the beſt of which is that made of ſhreds of parchment; and when dry, is given to the weavers, who mount it on the loom.

The warp thus mounted, the weavers, who are two to each loom, one on each ſide, tread alternately on the treddle, firſt on the right ſtep, and then on the left, which raiſes and lowers the threads of the warp equally; between which they throw tranſverſely the ſhuttle from the one to the other; and every time that the ſhuttle is thus thrown, and a thread of the woof inſerted within the warp, they ſtrike it conjunctly with the ſame frame, wherein is faſtened the comb or reed, between whoſe teeth the threads of the warp are paſſed, repeating the ſtroke as often as is neceſſary.

The weavers having continued their work till the whole warp is filled with the woof, the cloth is finiſhed; it is then taken off the loom by unrolling it from the beam whereon it had been rolled in proportion as it was wove; and now given to be cleanſed of the knots, ends of threads, ſtraws, and other filth, which is done with iron nippers.

In this condition it is carried to the fullery, to be ſcoured with urine, or a kind of potters clay, well ſteeped in water, put along with the cloth in the trough wherein it is fulled. The cloth being again cleared from the earth or urine, is returned to the former hands to have the leſſer filth, ſmall ſtraws, &c. taken off as before: then it is returned to the fuller to be beat and fulled with hot water, wherein a ſuitable quantity of ſoap has been diſſolved; after fulling, it is taken out to be ſmoothed or pulled by the liſts lengthwiſe, to take out the wrinkles, crevices, &c.

The ſmoothing is repeated every two hours, till the fulling be finiſhed, and the cloth brought to its proper breadth; after which it is waſhed in clear water, to purge it of the ſoap, and given wet to the carders to raiſe the hair or nap on the right ſide with the thiſtle or weed. After this preparation, the cloth-worker takes the cloth, and gives it its firſt cut or ſhearing; then the carders reſume it, and after wetting, give it as many more courſes with the teazle, as the quality of the ſtuff requires, always obſerving to begin againſt the grain of the hair, and to end with it; as alſo to begin with a ſmoother thiſtle, proceeding ſtill with one ſharper and ſharper, as far as the ſixth degree.

After theſe operations, the cloth being dried, is returned to the cloth-worker, who ſheers it a ſecond time, and returns it to the carders, who repeat their operation as before, till the nap be well ranged on the ſurface of the cloth, from one end of the piece to the other.

The cloth thus wove, ſcoured, napped, and ſhorn, is ſent to the dyer; when dyed, it is waſhed in fair water, and the worker takes it again wet as it is, lays the nap with a bruſh on the table, and hangs it on the tenters, where it is ſtretched both in length and breadth ſufficiently to ſmooth it, ſet it ſquare, and bring it to its proper dimenſions, without ſtraining it too much; obſerving to bruſh it afreſh, the way of the nap, while a little moiſt, on the tenters.

When quite dry, the cloth is taken off the tenters, and bruſhed again on the table, to finiſh the laying of the nap; after which it is folded, and laid cold under a preſs, to make it perfectly ſmooth and even, and give it a gloſs.

Laſtly, the cloth being taken out of the preſs, and the papers, &c. for gloſſing it removed, it is in a condition for ſale or uſe. With regard to the manufacture of mixt cloths, or thoſe wherein the wools are firſt dyed, and then mixt, ſpun, and wove of the colours intended, the proceſs, except what relates to the colour, is moſtly the ſame with that juſt repreſented.

Cloth made from Vegetable Filaments. See Bark and Filaments.

Incombuſtible Cloth. See Asbestos.

CLOTHO, the youngeſt of the three Parcæ, daughters of Jupiter and Themis. She was ſuppoſed to preſide over the moment that we are born. She held the diſtaff in her hand, and ſpun the thread of life, whence her name κλωθειν, *to ſpin*. She was repreſented wearing a crown with ſeven ſtars, and covered with a variegated robe.

1
Cauſe of the formation of clouds uncertain.

CLOUD, a collection of vapours ſuſpended in the atmoſphere.

That the clouds are formed from the aqueous vapours, which before were ſo cloſely united with the atmoſphere as to be inviſible, is univerſally allowed; but it is no eaſy matter to account for the long continuance of ſome very opaque clouds without diſſolving; or to give a reaſon why the vapours, when they have once begun to condenſe, do not continue to do ſo till they at laſt fall to the ground in the form of rain or ſnow, &c. The general cauſe of the formation of clouds, it has been ſuppoſed, is a ſeparation of the latent heat from the water of which the vapour is compoſed. The conſequence of this ſeparation muſt be the condenſation of that vapour, in ſome degree at leaſt: in ſuch caſe, it will firſt appear as a ſmoke, miſt, or fog; which, if interpoſed betwixt the ſun and earth, will form a cloud; and the ſame cauſes continuing to act, the cloud will produce rain or ſnow. But though the ſeparation of this latent heat in a certain degree is the immediate cauſe of the formation of clouds, the remote cauſe, or the changes produced in the atmoſphere, whereby ſuch a ſeparation may be induced, are much more difficult to be diſcovered. In common obſervation, we ſee that vapour is moſt powerfully condenſed by cold ſubſtances, ſuch as metals, water, &c. But cold alone cannot in all caſes cauſe the condenſation of the atmoſpherical vapours, otherwiſe the nights behoved to be always foggy or cloudy, owing to the vapours, raiſed throughout the day by the heat of the ſun, being condenſed by the ſuperior coldneſs of the night. Great rains will happen in very warm weather, when the union of the vapours with the atmoſphere ought rather to be promoted than diſſolved, if cold was the only agent in their condenſation. The ſerenity of the atmoſphere, alſo, in the moſt ſevere froſts, abundantly ſhows that ſome other cauſe beſides mere heat or cold is concerned in the formation of clouds, and condenſation of the atmoſpherical vapours.

2
Not always owing to cold.

3
Electricity probably concerned.

The electric fluid is now ſo generally admitted as an agent in all the great operations of nature, that it is no wonder to find the formation of clouds attributed to it. This hath accordingly been given by S. Beccaria as the cauſe of the formation of all clouds whatſoever, whether of thunder, rain, hail, or ſnow. The firſt, he thinks, are produced by a very great power of electricity, and the others by one more moderate. But though it is certain that all clouds, or even fogs and rain, are electrified in ſome degree, it ſtill remains a queſtion, whether the clouds are formed in conſequence of the vapour whereof they are compoſed being firſt electrified, or whether they become electrified in conſequence of its being firſt ſeparated from the atmoſphere, and in ſome meaſure condenſed. This hath not yet, as far as we know, been aſcertained by the experiments of Beccaria, or any other perſon; and indeed, notwithſtanding the multitude of electrical diſcoveries that have lately been made, there ſeems to be little or no foundation for aſcertaining it. Electricity is known to be in many caſes a promoter of evaporation; but no experiments have yet been brought to prove that electrified air parts with its moiſture more readily than ſuch as is not electrified; ſo that, till the properties of electrified air are farther inveſtigated, it is impoſſible to lay down any rational theory of the formation of clouds upon this principle.

4
Clouds often prodigiouſly electrified.

But whether the clouds are produced, i. e. the inviſible vapours floating in the atmoſphere condenſed ſo as to become viſible, by means of electricity or not, it is certain that they do contain the electric fluid in

5 Terrible deſtruction by an electrified cloud in Java.

prodigious and inconceivable quantities, and many very terrible and deſtructive phenomena have been occaſioned by clouds very highly electrified. The moſt extraordinary inſtance of this kind perhaps on record happened in the iſland of Java, in the Eaſt Indies, in Auguſt 1772. On the 11th of that month, at midnight, a bright cloud was obſerved covering a mountain in the diſtrict called *Cheribon*, and at the ſame time ſeveral reports were heard like thoſe of a gun. The people who dwelt upon the upper parts of the mountain not being able to fly faſt enough, a great part of the cloud, almoſt three leagues in circumference, detached itſelf under them, and was ſeen at a diſtance riſing and falling like the waves of the ſea, and emitting globes of fire ſo luminous, that the night became as clear as day. The effects of it were aſtoniſhing; every thing was deſtroyed for ſeven leagues round; the houſes were demoliſhed; plantations were buried in the earth; and 2140 people loſt their lives, beſides 1500 head of cattle, and a vaſt number of horſes, goats, &c.

6 By another in the iſland of Malta.

Another inſtance of a very deſtructive cloud, the electric qualities of which will at preſent ſcarcely be doubted, is related by Mr Brydone, in his Tour through Malta. It appeared on the 29th of October 1757. About three quarters of an hour after midnight, there was ſeen to the ſouth-weſt of the city of Melita, a great black cloud, which, as it approached, changed its colour, till at laſt it became like a flame of fire mixed with black ſmoke. A dreadful noiſe was heard on its approach, which alarmed the whole city. It paſſed over the port, and came firſt on an Engliſh ſhip, which in an inſtant was torn in pieces, and nothing left but the hulk; part of the maſts, ſails, and cordage, were carried to a conſiderable diſtance along with the cloud. The ſmall boats and felloques that fell in its way were all broken to pieces and ſunk. The noiſe increaſed, and became more frightful. A ſentinel, terrified at its approach, ran into his box; but both he and it were lifted up and carried into the ſea, where he periſhed. It then traverſed a conſiderable part of the city, and laid in ruins almoſt every thing that ſtood in its way. Several houſes were laid level with the ground, and it did not leave one ſteeple in its paſſage. The bells of ſome of them, together with the ſpires, were carried to a conſiderable diſtance; the roofs of the churches demoliſhed and beat down, &c. It went off at the north-eaſt point of the city, and demoliſhing the light-houſe, is ſaid to have mounted up into the air with a frightful noiſe; and paſſed over the ſea to Sicily, where it tore up ſome trees, and did other damage; but nothing conſiderable, as its fury had been moſtly ſpent at Malta. The number of killed and wounded amounted to near 200; and the loſs of ſhipping, &c. was very conſiderable.

7 Inſtance of two people involved in a thunder-cloud.

The effects of thunder-ſtorms, and the vaſt quantity of electricity collected in the clouds which produce theſe ſtorms, are ſo well known, that it is ſuperfluous to mention them. It appears, however, that even theſe clouds are not ſo highly electrified as to produce their fatal effects on thoſe who are immerſed in them. It is only the diſcharge of part of their electricity upon ſuch bodies as are either not electrified at all, or not ſo highly electrified as the cloud, that does all the miſchief. We have, however, only the following inſtance on record, of any perſons being immerſed in the body of a thunder-cloud. Profeſſor Sauſſure and young Mr Jalabert, when travelling over one of the high Alps, were caught among clouds of this kind; and, to their aſtoniſhment, found their bodies ſo full of electrical fire, that ſpontaneous flaſhes darted from their fingers with a crackling noiſe, and the ſame kind of ſenſation as when ſtrongly electrified by art.

8 Height of the clouds.

The height of clouds in general is not great; the ſummits of very high mountains being commonly quite free from them, as Mr Brydone experienced in his journey up Mount Ætna; but thoſe which are moſt highly electrified deſcend loweſt, their height being often not above ſeven or eight hundred yards above the ground; nay, ſometimes thunder-clouds appear actually to touch the ground with one of their edges *: but the generality of clouds are ſuſpended at the height of a mile, or little more, above the earth. Some, however, have imagined them to ariſe to a moſt incredible and extravagant height. Maignan of Thoulouſe, in his Treatiſe of Perſpective, p. 93, gives an account of an exceeding bright little cloud that appeared at midnight in the month of Auguſt, which ſpread itſelf almoſt as far as the zenith. He ſays that the ſame thing was alſo obſerved at Rome; and from thence concludes that the cloud was a collection of vapours raiſed beyond the projection of the earth's ſhadow, and of conſequence illuminated by means of the ſun. This, however, can by no means be credited; and it is much more probable that this cloud owed its ſplendor to electricity, than to the reflection of the ſolar beams.

9 Their various colours accounted for.

In the evenings after ſunſet, and mornings before ſunriſe, we often obſerve the clouds tinged with beautiful colours. They are moſtly red; ſometimes orange, yellow, or purple; more rarely bluiſh; and ſeldom or never green. The reaſon of this variety of colours, according to Sir Iſaac Newton, is the different ſize of the globules into which the vapours are condenſed. This is controverted by Mr Melville, who thinks that the clouds reflect the ſun's light preciſely as it is tranſmitted to them through the atmoſphere. This reflects the moſt refrangible rays in the greateſt quantity; and therefore ought to tranſmit the leaſt refrangible ones, red, orange, and yellow to the clouds, which accordingly appear moſt uſually of thoſe colours. In this opinion he was greatly confirmed by obſerving, when he was in Switzerland, that the ſnowy ſummits of the Alps turned more and more reddiſh after ſunſet, in the ſame manner as the clouds; and he imagines, that the ſemitranſparency of the clouds, and the obliquity of their ſituation, tend to make the colours in them much more rich and copious than thoſe on the tops of ſnowy mountains.

10 Of the motions of clouds.

The motions of the clouds, though ſometimes directed by the wind, are not always ſo, eſpecially when thunder is about to enſue. In this caſe they ſeem to move very ſlowly, and often to be abſolutely ſtationary for ſome time. The reaſon of this moſt probably is, that they are impelled by two oppoſite ſtreams of air nearly of equal ſtrength; by which means their velocity is greatly retarded. In ſuch caſes both the aerial currents ſeem to aſcend to a very conſiderable height; for Meſſ. Charles and Roberts, when endeavouring to avoid a thunder-cloud in one of their aerial voyages, could find no alteration in the courſe of the current, though they aſcended to the height of 4000 feet from the ſurface of the earth. In ſome caſes the motions of the clouds evidently depend on their electricity, independent of any current of air whatever. Thus, in a calm and warm day, we often ſee ſmall clouds meeting each other in oppoſite directions, and ſetting out from ſuch ſhort diſtances, that we cannot ſuppoſe any oppoſite winds to be the cauſe. Theſe clouds, when they meet, inſtead of forming a larger one, become much leſs, and ſometimes vaniſh altogether; a circumſtance undoubtedly owing to the diſcharge of oppoſite electricities into each other. This ſerves alſo to throw ſome light on the true cauſe of the formation of clouds; for if two clouds electrified, the one poſitively and the other negatively, deſtroy each other in contact; it follows, that any quantity of vapour ſuſpended in the atmoſphere, while it retains its natural quantity of electricity, remains inviſible, but becomes a cloud when electrified either *plus* or *minus*. A difficulty, however, ſtill occurs; viz. in what manner a ſmall quantity of vapour ſurrounded by an immenſe ocean of the ſame kind of matter, can acquire either more or leſs electricity than that which ſurrounds it; and this indeed we ſeem not as yet to have any data to ſolve in a ſatisfactory manner.

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* See *Thunder*.

11 Their hapes. The ſhapes of the clouds are likewiſe undoubtedly owing to their electricity; for in thoſe ſeaſons in which a great commotion has been excited in the atmoſpherical electricity, we ſhall perceive the clouds aſſuming ſtrange and whimſical ſhapes, which vary almoſt every moment. This, as well as the meeting of ſmall clouds in the air, and vaniſhing upon contact, is an almoſt infallible ſign of thunder.

12 Connec-ion of the louds with vind. Beſides the phenomena of thunder, rain, &c. the clouds are intimately connected with thoſe of wind, and always aſſume a particular ſhape, when a ſtrong continued wind is about to enſue; though it is remarkable, that in the ſtrongeſt winds we ſhall often obſerve them ſtationary. Sometimes alſo, on the approach of a cloud, we ſhall find a ſudden and violent guſt of wind ariſe; and at others, the wind, though violent before, ſhall ceaſe on the approach of a cloud, and recover its ſtrength as ſoon as the cloud is paſt. This connection of the clouds with wind is moſt remarkable in mountainous countries, when the peaks are ſufficiently high to have their tops involved in clouds. A very remarkable mountain of this kind is met with at the Cape of Good Hope, from the clouds on whoſe top, according to the relations of travellers, the winds iſſue forth as if they had been confined in a bag; and ſomething ſimilar has been obſerved of mountains in other parts of the world.

13 heir uſes. The uſes of the clouds are evident; as from them proceeds the rain which refreſhes the earth; and without which, according to the preſent ſyſtem of nature, the whole ſurface of the earth muſt be a mere deſert. They are likewiſe of great uſe as a ſcreen interpoſed between the earth and the ſcorching rays of the ſun, which are often ſo powerful as to deſtroy the graſs and other tender vegetables. In the more ſecret operations of nature alſo, where the electrical fluid is concerned, the clouds bear a principal ſhare; and ſerve eſpecially as a medium for conveying that fluid from the atmoſphere into the earth, and from the earth into the atmoſphere; in doing which, when electrified to a great degree, they ſometimes produce very terrible effects; of which inſtances have been already given.

CLOVE-TREE. See CARYOPHYLLUS, BOTANY *Index*.

CLOVE, a term uſed in weights of wool. Seven pounds make a clove. In Eſſex, eight pounds of cheeſe and butter go to the clove.

Clove July-flower. See DIANTHUS, BOTANY *Index*.

CLOVER-GRASS. See TRIFOLIUM, BOTANY *Index*, and AGRICULTURE *Index*.

CLOUGH, or DRAUGHT, in commerce, an allowance of two pounds in every hundred weight for the turn of the ſcale, that the commodity may hold out weight when ſold out by retail.

CLOVIO, GIORGIO GIULIO, hiſtory and portrait painter, was born in Sclavonia, in 1498. Having in the early part of his youth applied himſelf to literature, his genius prompted him to purſue the art of painting for a profeſſion; and at 18 years of age he went to Rome, where he ſpent three years to perfect his hand in drawing, and devoted himſelf entirely to painting in miniature. His knowledge of colouring was eſtabliſhed by the inſtructions of Julio Romano, and his taſte of compoſition and deſign was founded on the obſervations he made on the works of Michael Angelo Buonaroti. By thoſe aſſiſtances he arrived at ſuch a degree of excellence in portrait as well as in hiſtory, that in the former he was accounted equal to Titian, and in the latter not inferior to Buonaroti. He died in 1578. His works are exceedingly valuable, and are at this day numbered among the curioſities of Rome. Vaſari, who had ſeen the wonderful performances of Clovio, with inexpreſſible aſtoniſhment, enumerates many of his portraits and hiſtorical compoſitions, and ſeems to be almoſt at a loſs for language ſufficiently expreſſive of their merit. He mentions two or three pictures on which the artiſt had beſtowed the labour of nine years; but the principal picture repreſented Nimrod, building the Tower of Babel; which was ſo exquiſitely finiſhed, and ſo perfect in all its parts, that it ſeemed quite inconceivable how the eye or the pencil could execute it. He ſays it is impoſſible to imagine any thing ſo admirably curious; whether one conſiders the elegance of the attitudes, the richneſs of the compoſition, the delicacy of the naked figures, the perſpective proportion of the objects, the tender diſtances, the ſcenery, the buildings, or other ornaments; for every part is beautiful and inimitable. He alſo takes notice of a ſingle ant introduced in one of the pictures of this maſter; which, though exceedingly and incredibly ſmall, is yet ſo perfect, that even the moſt minute member was as diſtinct as if it had been painted of the natural ſize.

CLOVIS I. was the real founder of the French monarchy; for he was the firſt conqueror of the ſeveral provinces of Gaul, poſſeſſed before his time by the Romans, Germans, and Goths. Theſe he united to the then ſcanty dominions of France, removed the ſeat of government from Soiſſons to Paris, and made this the capital of his new kingdom. He died in 511, in the 46th year of his age and 31ſt of his reign. See (*Hiſt. of*) FRANCE.

CLOUTS, in *Gunnery*, are thin plates of iron nailed on that part of the axle-tree of a gun-carriage which comes through the nave, and through which the linſpin goes.

CLOYNE, a town of Ireland, in the county of Cork and province of Munſter. W. Long. 8. 0. N. Lat. 51. 40. It is but a ſmall place, though an epiſcopal reſidence. A church was built, and a biſhopric erected here, by St Colman, who died on the 4th of November 604; and in 707 an abbey was alſo founded here. In 1430, the biſhopric was united to that of Cork; and the union continued till the 11th of November 1638, when Dr George Synge was conſecrated biſhop of Cloyne; ſince which time this ſee has been governed by its own prelates, one of whom was the celebrated Berkeley. This ſee is not taxed in the king's books; but is now reputed to be worth 2500l. a-year. The chapter of Cloyne is compoſed of a dean, chapter, chancellor, treaſurer, an archdeacon, and fourteen prebendaries. The dioceſe is divided into four rural deaneries, and the collegiate church of St Mary of Youghal is united to the biſhopric. The cathedral is a decent Gothic building. The nave is about 120 feet long; having lateral aiſles, beſides the croſs aiſles, divided by Gothic arches, five on each ſide. In the choir there is an excellent organ. The biſhop's palace, which was rebuilt at the beginning of the preſent century, is large and convenient. To the north-weſt of Cloyne is a reputed holy well, dedicated to St Colman, which is much frequented on the 24th of November, being the patron day.

CLUE of a sail, the lower corner; and hence

Clue-Garnets are a ſort of tackles faſtened to the clues, or lower corners of the mainſail or foreſail, to truſs them up to the yard as occaſion requires, which is uſually termed *clueing up the ſails*.

Clue-Lines are for the ſame purpoſe as clue-garnets; only that the latter are confined to the courſes, whereas the former are common to all the ſquare ſails. See theſe ropes as repreſented in the article Ship.

CLUNIA, in *Ancient Geography*, a principal town of the Hither Spain, a Roman colony, with a conventus juridicus, on the Durius, to the weſt of Numantia. Now *Corunna del Conde*.

CLUNIUM, in *Ancient Geography*, a town of Corſica, near Baſtia. Now *St Catharine*.

CLUNY, or clugny, a celebrated abbey of Benedictine monks, in a city of that name; being the head or chief of a congregation denominated from them.

It is ſituated in the Maſonnois, a little province of France, on the river Grône; and was founded by William duke of Berry and Aquitain; or, as others ſay, by the abbot Bernon, ſupported by that duke, in the year 910.

This abbey was anciently ſo very ſpacious and magnificent, that in 1245, after the holding of the firſt council of Lyons, Pope Innocent IV. went to Cluny, accompanied with the two patriarchs of Antioch and Conſtantinople, 12 cardinals, 3 archbiſhops, 15 biſhops, and a great number of abbots; who were all entertained, without one of the monks being put out of their place; though S. Louis, Q. Blanche his mother, the duke of Artois his brother, and his ſiſter, the emperor of Conſtantinople, the ſons of the kings of Arragon and Caſtile, the duke of Burgundy, ſix counts, and a great number of lords, with all their retinues, were there at the ſame time.

Cluny, at its firſt erection, was put under the immediate protection of the apoſtolic ſee, with expreſs prohibition to all ſecular and eccleſiaſtic powers, to diſturb the monks in the poſſeſſions of their effects, or the election of their abbot. By this they pretended to be exempted from the juriſdiction of biſhops; which at length gave the hint to other abbeys to inſiſt on the ſame.

Cluny is the head of a very numerous and extenſive congregation: in effect, it was the firſt congregation of divers monaſteries united under one chief, ſo as only to conſtitute one body, or, as they call it, one order, that ever aroſe.

This order of monks was brought into England by William earl of Warren, ſon-in-law to William the Conqueror, who built a houſe for them at Lewis in Suſſex about the year 1077. There were 27 priories and cells of this order in England, which were governed by foreigners, afterwards made denizens.

CLUPEA, or Herring, in *Ichthyology*, a genus belonging to the order of abdominales. The upper jaw is furniſhed with a ſerrated myſtache; the branchioſtege membrane has eight rays; a ſcaly ſerrated line runs along the belly from the head to the tail; and the belly-fins have frequently nine rays. There are 11 ſpecies, viz.

1. The harengus, or common herring, has no ſpots, and the under jaw is longer than the upper one. A herring dies immediately after it is taken out of the water; whence the proverb ariſes, *As dead as a herring*. The meat is everywhere in great eſteem, being fat, ſoft, and delicate; eſpecially if it is dreſſed as ſoon as caught, for then it is incomparably better than on the next day.

The herring was unknown to the ancients. Notwithſtanding the words χαλκις and μαινις are by tranſlators rendered *halec*, the characters given to thoſe fiſh are common to ſuch numbers of different ſpecies as render it impoſſible to ſay which they intended.

1 Herrings where found.

2 Immenſe ſhoals of them.

Herrings are found from the higheſt northern latitudes yet known, as low as the northern coaſts of France; and except one inſtance, brought by Dod, of a few being once taken in the bay of Tangier, none are ever found more ſoutherly. They are met with in vaſt ſhoals on the coaſt of America, as low as Carolina. In Cheſapeak-bay is an annual inundation of thoſe fiſh, which cover the ſhore in ſuch quantities as to become a nuiſance. We find them again in the ſeas of Kamtſchatka, and probably they reach Japan; for Kempfer mentions, in his account of the fiſh of that country, ſome that are congenerous. The great winter rendezvous of the herring is within the arctic circle: there they continue for many months in order to recruit themſelves after the fatigue of ſpawning; the ſeas within that ſpace ſwarming with inſect food in a far greater degree than thoſe of our warmer latitudes. This mighty army begins to put itſelf in motion in the ſpring; we diſtinguiſh this vaſt body by that name; for the word *herring* comes from the German *heer*, "an army," to expreſs their numbers. They begin to appear off the Shetland iſles in April and May; theſe are only the forerunners of the grand ſhoal which comes in June; and their appearance is marked by certain ſigns, by the numbers of birds, ſuch as gannets and others which follow to prey on them; but when the main body approaches, its breadth and depth is ſuch as to alter the appearance of the very ocean. It is divided into diſtinct columns of five or ſix miles in length, and three or four in breadth, and they drive the water before them with a kind of rippling: ſometimes they ſink for the ſpace of ten or fifteen minutes, and then riſe again to the ſurface; and in fine weather reflect a variety of ſplendid colours like a field of the moſt precious gems; in which, or rather in a much more valuable, light ſhould this ſtupendous gift of Providence be conſidered by the inhabitants of the Britiſh iſles.

The firſt check this army meets in its march ſouthward is from the Shetland iſles, which divide it into two parts; one wing takes to the eaſt, the other to the weſtern ſhores of Great Britain, and fill every bay and creek with their numbers; others paſs on towards Yarmouth, the great and ancient mart of herrings: they then paſs through the Britiſh Channel, and after that, in a manner diſappear. Thoſe which take towards the weſt, after offering themſelves to the Hebrides, where the great ſtationary fiſhery is, proceed to the north of Ireland, where they meet with a ſecond interruption, and are obliged to make a ſecond diviſion: the one takes to the weſtern ſide, and is ſcarce perceived, being ſoon loſt in the immenſity of the Atlantic; but the other, that paſſes into the Iriſh ſea, rejoices and feeds the inhabitants of moſt of the coaſts that border on it. Theſe brigades, as we may call them, which are thus ſeparated from the greater columns, are often capricious in their motions, and do not ſhow an invariable attachment to their haunts.

3
onderful ſtinct of eſe creares.

Were we inclined to conſider this partial migration in a moral light, we might reflect with veneration and awe on the mighty power which originally impreſſed on this moſt uſeful body of his creatures the inſtinct that directs and points out the courſe, that bleſſes and inriches theſe iſlands, which cauſes them at certain and invariable times to quit the vaſt polar deeps, and offer themſelves to our expecting fleets. That benevolent Being has never been known from the earlieſt account of time, once to withdraw this bleſſing from the whole; though he often thinks proper to deny it to particulars, yet this partial failure (for which we ſee no natural reaſon) ſhould fill us with the moſt exalted and grateful ſenſe of his Providence for impreſſing ſuch an invariable and general inſtinct on theſe fiſh towards a ſouthward migration when the whole is to be benefited, and to withdraw it when only a minute part is to ſuffer.

This inſtinct was given them, that they might remove for the ſake of depoſiting their ſpawn in warmer ſeas, that would mature and vivify it more aſſuredly than thoſe of the frozen zone. It is not from defect of food that they ſet themſelves in motion; for they come to us full of fat, and on their return are almoſt univerſally obſerved to be lean and miſerable. What their food is near the pole we are not yet informed; but in our ſeas they feed much on the *oniſcus marinus*, a cruſtaceous inſect, and ſometimes on their own fry.

They are full of roe in the end of June, and continue in perfection till the beginning of winter, when they depoſit their ſpawn. The young herrings begin to approach the ſhores in July and Auguſt, and are then from half an inch to two inches long: thoſe in Yorkſhire are called *herring ſile*. Though we have no particular authority for it, yet as very few young herrings are found in our ſeas during winter, it ſeems moſt certain that they muſt return to their parental haunts beneath the ice, to repair the vaſt deſtruction of their race during ſummer by men, fowl, and fiſh. Some of the old herrings continue on our coaſt the whole year: the Scarborough fiſhermen never put down their nets but they catch a few; but the numbers that remain are not worth compariſon with thoſe that return. See *Herring-Fishery*.

4
Young ones probably retire with their parents.

The Dutch are moſt extravagantly fond of this fiſh when it is pickled. A premium is given to the firſt buſs that arrives in Holland with a lading of this their ambroſia, and a vaſt price given for each keg. There is as much joy among the inhabitants on its arrival, as the Egytians ſhow on the firſt overflowing of the Nile. Flanders had the honour of inventing the art of pickling herrings. One William Beauklen of Biverlet, near Sluys, hit on this uſeful expedient; from him was derived the name *pickle*, which we borrow from the Dutch and German. Beauklen died in 1397. The emperor Charles V. held his memory in ſuch veneration for the ſervice he did to mankind, as to do his tomb the honour of a viſit. It is very ſingular that moſt nations give the name of their favourite diſh to the facetious attendant on every mountebank. Thus, the Dutch call him *pickle herring*; the Italians *macaroni*; the French, *jean pottage*; the Germans, *hans wurſt*, that is, *jack ſauſage*; and the Engliſh dignify him with the name of *jack pudding*.

5
Pickling of herrings, when invented.

6
Sprattus, where found.

2. The *ſprattus* has 13 rays in the back fin. It is a native of the European ſeas, and has a great reſemblance to the herring, only it is of a leſs ſize. They come into the river Thames below bridge in the beginning of November, and leave it in March; and are, during that ſeaſon, a great relief to the poor of the capital. At Graveſend and at Yarmouth they are cured like red-herrings; they are ſometimes pickled, and are little inferior in flavour to the anchovy, but the bones will not diſſolve like thoſe of the latter.

7
Aloſa, or ſhad, where found.

3. The *aloſa*, or *ſhad*, has a forked ſnout, and black ſpots on the ſides. According to Belonius and Haſſelquiſt, this is a fiſh of paſſage in the Nile. The laſt ſays, it is found in the Mediterranean near Smyrna, and on the coaſt of Egypt near Roſetta; and that in the months of December and January it aſcends the Nile as high as Cairo, where the people ſtuff it with pot marjoram; and when dreſſed in that manner, it will very nearly intoxicate the eater. In Great Britain the Severn affords this fiſh in higher perfection than any other river. It makes its firſt appearance there in May, but in very warm ſeaſons in April; for its arrival ſooner or later depends much on the temper of the air. It continues in the river about two months, and then is ſucceeded by a variety which we ſhall have occaſion to mention hereafter.

8
The fineſt inhabit the Severn.

The Severn ſhad is eſteemed a very delicate fiſh about the time of its firſt appearance, eſpecially in that part of the river that flows by Glouceſter, where they are taken in nets, and uſually ſell dearer than ſalmon: ſome are ſent to London, where the fiſhmongers diſtinguiſh them from thoſe of the Thames by the French name *aloſe*. Whether they ſpawn in this river and the Wye is not determined, for their fry has not yet been diſcovered. The old fiſh come from the ſea into the river in full roe. In the months of July and Auguſt, multitudes of bleak frequent the river near Glouceſter; ſome of them are as big as a ſmall herring, and theſe the fiſhermen erroneouſly ſuppoſe to be the fry of the ſhad. Numbers of theſe are taken near Glouceſter, in thoſe months only, but none of the emaciated ſhad are ever caught in their return.

9 Twaite deſcribed. The Thames ſhad does not frequent that river till the latter end of May or beginning of June, and is eſteemed a very coarſe and inſipid ſort of fiſh. The Severn ſhad is ſometimes caught in the Thames, though rarely, and called *allis* (no doubt *aloſe*, the French name) by the fiſhermen in that river. About the ſame time, and rather earlier, the variety called, near Glouceſter, the *twaite*, makes its appearance, is taken in great numbers in the Severn, and is held in as great diſrepute as the ſhad of the Thames. The differences between each variety are as follow: the true ſhad weighs ſometimes eight pounds; but their general ſize is from four to five. The *twaite*, on the contrary, weighs from half a pound to two pounds, which it never exceeds. The *twaite* differs from a ſhad only in having one or more round black ſpots on the ſides; if only one, it is always near the gill; but commonly there are three or four, placed one under the other.

10 Anchovy deſcribed. 4. The *encraſicolus*, or *anchovy*, has its upper jaw longer than the under one, and is about three inches long. They are taken in vaſt quantities in the Mediterranean, and are brought over here pickled. The great fiſhery is at Georgia, a ſmall iſle weſt of Leghorn. See *Anchovy-Fishery*.

The other ſpecies are, 5. The atherinoides has a ſhining line on each ſide, and ſmall belly-fins. It is a native of Surinam. 6. The thriſſa has 28 rays in the fin at the anus. It is found in the Indian ocean. 7. The ſima has yellow fins, thoſe of the belly being very ſmall. The mouth is flat; the upper jaw is very ſhort; the body is of a ſhining ſilver colour, and the fins are yellow. It is a native of Aſia. 8. The ſternicla has no belly-fins, and the body is broad. It is a native of Surinam. 9. The myſtus is ſhaped like a ſword, and the fins at the anus are united. It is found in the Indian ocean. 10. The tropica has a wedge-like tail, and a white, broad, compreſſed body. It is found at Aſcenſion iſland. 11 The ſinenſis is very like the common herring, but broader. It has no teeth, and is a native of China.

CLUSIA, the BALSAM-TREE. See BOTANY *Index*.

CLUSINA PALUS, in *Ancient Geography*, a lake of Tuſcany, extending north-weſt between Cluſium and Arretium, and communicating with the Arnus and Clanis. Now *Chiana Palude*.

CLUSINI FONTES, (Horace), baths in Tuſcany, in the territory of Cluſium, between this laſt to the north, and Acula to the ſouth, at the diſtance of eight miles from each. Now *Bagni di S. Caſciana*.

CLUSIUM, anciently called *Camars*, (Virgil, Livy); a town of Tuſcany, at the ſouth end of the Palus Cluſina, where it forms the Clanis; the royal reſidence of Porſenna, three days journey from Rome to the north, (Polybius). *Cluſinus* the epithet. *Cluſini Veteres* the people. Now *Chiuſi*. E. Long. 13°, Lat. 43°.—*Cluſium Novum*, was a town of Tuſcany, near the ſprings of the Tiber, in the territory of Arretium; where lies the Ager Cluſinus; now called *Caſentino*. *Cluſini Novi*, the people, (Pliny).

CLUTIA. See BOTANY *Index*.

CLUVIER, PHILIP, in Latin *Cluverius*, a celebrated geographer, born at Dantzic in 1580. He travelled into Poland, Germany, and the Netherlands, in order to ſtudy law; but, being at Leyden, Joſeph Scaliger perſuaded him to give way to his genius for geography. Cluvier followed his advice, and for this purpoſed viſited the greateſt part of the European ſtates. He was well verſed in many languages; and wherever he went, obtained illuſtrious friends and protectors. At his return to Leyden, he taught there with great applauſe; and died in 1623, aged 43. He wrote, 1. *De tribus Rheni alveis*. 2. *Germania antiqua*. 3. *Sicilia antiqua*. 4. *Italia antiqua*. 5. *Introductio in univerſam Geographiam*. All juſtly eſteemed.

CLYDE, a river in Scotland, which, ariſing in Annandale, falls into the ſea over againſt the iſle of Bute. Next to the Tay, it is the largeſt river in Scotland, and is navigable for ſmall craft up to Glaſgow. The canal, which joins the Forth, falls into it a little below that city. The cataract called the *Frith of the Clyde*, oppoſite to Lanark, is a great natural curioſity, and the firſt ſcene of the kind of Great Britain. This tremendous ſheet of water for about a mile falls from rock to rock. At Stone-byers, the firſt fall is about 60 feet; the laſt, at Cora-Lynn, is over ſolid rock, not leſs than 100 feet high. At both theſe places this great body of water exhibits a grander and more intereſting ſpectacle than imagination can poſſibly conceive.

At Cora-Lynn, the falls are ſeen to moſt advantage from a ruinous pavilion in a garden, placed in a lofty ſituation. The cataract is full in view, ſeen over the tops of trees and buſhes, precipitating itſelf, for an amazing way, from rock to rock, with ſhort interruptions, forming a rude ſlope of furious foam. The ſides are bounded by vaſt rocks, clothed on their tops with trees: on the ſummit and very verge of one is a ruined tower, and in front a wood overtopt by a verdant hill. A path conducts the traveller down to the beginning of the fall, into which projects a high rock, in floods inſulated by the water; and from the top is a tremendous view of the furious ſtream. In the cliffs of this ſavage retreat the brave Wallace is ſaid to have concealed himſelf, meditating revenge for his injured country.

On regaining the top, the walk is formed near the verge of the rocks, which on both ſides are perfectly mural and equidiſtant, except where they overhang: the river is pent up between them at a diſtance far beneath; not running, but rather ſliding along a ſtony bottom ſloping, the whole way. The ſummits of the rock are wooded; the ſides ſmooth and naked; the ſtrata narrow and regular, forming a ſtupendous natural maſonry. After a walk of above half a mile on the edge of this great chaſm, on a ſudden appears the great and bold fall of Boniton, in a foaming-ſheet, far-projecting into a hollow, in which the water ſhows a violent agitation, and a wide extending miſt ariſes from the ſurface. Above that is a ſecond great fall; two leſſer ſucceed; beyond them the river winds, grows more tranquil, and is ſeen for a conſiderable way, bounded on one ſide by wooded banks, on the other by rich and ſwelling fields.

The great fall of Stone-byers, firſt mentioned, has more of the horrible in it than any of the others, and is ſeen with more difficulty: it conſiſts of two precipitous cataracts falling one above the other into a vaſt chaſm, bounded by lofty rocks, forming an amazing theatre to the view of thoſe who take the pains to deſcend to the bottom. Between this and Cora-Lynn there is another fall called *Dundoſſlin*.

CLYMENE, in fabulous hiſtory, the daughter of Oceanus, who, being beloved by Apollo, he had by her Phaëton, Lampatia, Egle, and Phebe. See PHAETON.

CLYPEOLA, TREACLE-MUSTARD. See BOTANY *Index*.

CLYSSUS, an extract prepared, not from one, but ſeveral bodies mixed together; and, among the moderns, the term is applied to ſeveral extracts prepared from the ſame body, and then mixed together.

CLYSTER, is a liquid remedy, to be injected chiefly at the anus into the larger inteſtines. It is uſually adminiſtered by the bladder of a hog, ſheep, or ox, perforated at each end, and having at one of the apertures an ivory pipe faſtened with pack-thread. But the French, and ſometimes the Dutch, uſe a pewter ſyringe, by which the liquor may be drawn in with more eaſe and expedition than in the bladder, and likewiſe more forcibly expelled into the large inteſtines. This remedy ſhould never be adminiſtered either too hot or too cold, but tepid; for either of the former will be injurious to the bowels.

Clyſters are ſometimes uſed to nouriſh and ſupport a patient who can ſwallow little or no aliment, by reaſon of ſome impediment in the organs of deglutition; in which caſe they may be made of broth, milk, ale, and decoctions of barley and oats with wine. The Engliſh introduced a new kind of clyſter, made of the ſmoke of tobacco, which has been uſed by ſeveral other nations, and appears to be of conſiderable efficacy when other clyſters prove ineffectual, and particularly in the iliac paſſion, in the *hernia incarcerata*, and for the recovery of drowned perſons.

CLYTEMNESTRA, in fabulous hiſtory, the daughter of Jupiter and Leda. She married Agamemnon; but while that prince was at the ſiege of Troy, ſhe had an amorous intrigue with Ægiſthus, whom ſhe engaged to murder Agamemnon at his return to his dominions. Her ſon Oreſtes, however, revenged the death of his father by killing Ægiſthus, with his mother Clytemneſtra; but was afterwards haunted by the Furies as long as he lived.

CLYTIA, or CLYTIE, daughter of Oceanus and Tethys, beloved by Apollo. She was deſerted by her lover, who paid his addreſſes to Leucothoe; and this ſo irritated her, that ſhe diſcovered the whole intrigue to her rival's father. Apollo deſpiſed her the more for this; and ſhe pined away, and was changed into a flower, commonly called a *ſun-flower*, which ſtill turns its head towards the ſun in his courſe in token of her love.

CNEORUM, WIDOW-WAIL. See BOTANY *Index*.

CNICUS, BLESSED-THISTLE. See BOTANY *Index*.

CNIDUS, in *Ancient Geography*, a Greek town of Caria; ſituated on a horn or promontory of a peninſula. It had in front a double port, and an iſland lying before it in form of a theatre, which being joined to the continent by moles or cauſeways, made *Cnidus* a Dipolis or double town, (Strabo), becauſe a great number of Cnidians inhabited the iſland. Pauſanias mentions a bridge which joined the iſland to the continent.—*Cnidii*, the people. *Cnidius*, the epithet.—*Cnidia Venus*, a principal divinity of the Cnidians, (Horace). Her ſtatue was executed by Praxiteles; and ſo exquiſitely done, and ſo much admired, that people came from all parts to view it (Pliny). Of this place was Eudoxus, the famous aſtronomer and geometrician, who had there an obſervatory (Strabo).

CNOSSUS, or CNOSUS, anciently called *Ceratos*, from a cognominal river running by it; a city of Crete, 23 miles to the eaſt of Gortina (Peutinger). Here ſtood the ſepulchre of Jupiter, the famous labyrinth, and the palace of Minos, a very ancient king; here happened the adventure of Ariadne his daughter with Theſeus, called *Gnoſis* (Ovid). Its port-town was Heracleum, on the eaſt ſide of the iſland.

COACH, a vehicle for commodious travelling, ſuſpended on leathers, and moved on wheels. In Britain, and throughout Europe, the coaches are drawn by horſes, except in Spain, where they uſe mules. In a part of the eaſt, eſpecially the dominions of the great Mogul, their coaches are drawn by oxen. In Denmark they ſometimes yoke rein-deer in their coaches; though rather for curioſity than uſe. The coachman is ordinarily placed on a ſeat raiſed before the body of the coach. But the Spaniſh policy has diſplaced him in that country by a royal ordinance; on occaſion of the Duke d'Olivares, who found that a very important ſecret, whereon he had conferred in his coach, had been overheard and revealed by his coachman: ſince that time the place of the Spaniſh coachman is the ſame with that of the French ſtage-coachman and our poſtilion, viz. on the firſt horſe on the left.

According to Profeſſor Beckmann, coaches of ſome kind were known about the beginning of the 16th century; but the uſe of them was limited to women of the higheſt rank. It was accounted diſgraceful in men to ride in them. It appears from the hiſtory of that period, that the electors and princes of the empire, when they did not chooſe to attend the meetings of the ſtates, excuſed themſelves to the emperor, by informing him, that their health would not permit them to travel on horſeback; and it was conſidered unbecoming to ride in carriages like women. But it ſeems alſo pretty certain, that about the end of the 15th century, the emperor, kings, and ſome princes, travelled in covered carriages, and alſo employed them on public ſolemnities.

The nuptial carriage of the firſt wife of Leopold, a Spaniſh princeſs, coſt, including the harneſs, 38,000 florins. The coaches uſed by that emperor are thus deſcribed. In the imperial coaches no great magnificence was to be ſeen, being covered over with red cloth and black nails. The harneſs was black, and no gold was to be ſeen in the whole work. They had glaſs pannels, for which reaſon they were called *impe-*

rial coaches. The harneſs was ornamented with fringes of red ſilk on days of feſtivity. The imperial coaches were only diſtinguiſhed by having leather traces, while the ladies in the emperor's ſuite were contented with traces made of ropes. Fifty gilt coaches having ſix horſes each, were to be ſeen in 1681 at the court of Erneſt Auguſtus of Hanover. The firſt time that plenipotentiaries appeared in coaches, was at the imperial commiſſion in 1613 held at Erfurth.

We meet with ample proof in the hiſtory of France, that the monarchs rode on horſes, the ſervants on mules, and ladies of diſtinction ſometimes on aſſes, at Paris, in the 14th, 15th, and even 16th centuries. Yet carriages of ſome kind ſeem to have been uſed in France at an early period, ſince there is ſtill preſerved a ſtatute of Philip the Fair, iſſued in 1294, for the ſuppreſſion of luxury, and in which the wives of citizens were prohibited the uſe of carriages.

The oldeſt coaches uſed by the ladies of England were denominated *whirlicotes*, a name now ſunk in oblivion. About the end of the 14th century, when Richard II. was forced to fly before his rebellious ſubjects, he and all his attendants travelled on horſeback, his mother alone riding in a coach, as ſhe was indiſpoſed. This became afterwards unfaſhionable, the daughter of Charles IV. having ſhowed the ladies of England how conveniently ſhe could ride on a ſide-ſaddle.

According to Stow, coaches firſt came to be uſed in England about the middle of the 16th century, having been introduced from Germany by the earl of Arundel. The Engliſh plenipotentiary came to Scotland in a coach in the year 1598, and they were generally uſed about the year 1605.

Authors obſerve, as a thing very ſingular, that there were at firſt no more than three coaches in Paris; the one that of the queen; the ſecond that of Diana miſtreſs of Henry II.; and the third belonged to Jean de Lava de Bois Dauphin; whoſe enormous bulk diſabled him from travelling on horſeback. One may hence judge how much vanity, luxury, and idleneſs, have grown upon our hands in later days; there being now computed in that ſame city no leſs than 15,000 coaches.

Coaches have had the fate of all other inventions, to be brought by degrees to their perfection; at preſent they ſeem to want nothing, either with regard to eaſe or magnificence. Louis XIV. of France made ſeveral ſumptuary laws for reſtraining the exceſſive richneſs of coaches, prohibiting the uſe of gold, ſilver, &c. therein; but they have had the fate to be neglected.

The following are the duties payable on carriages of this deſcription in Britain (1804).

For one carriage, with four wheels, the annual ſum of	L.10	0	0
For two	11	0	0
three	12	0	0
four	12	10	0
five	13	0	0
ſix	13	10	0
ſeven	14	0	0
eight	14	10	0
nine and upwards,	15	0	0
And for every additional body ſucceſſively uſed on the ſame carriage or number of wheels, the further ſum of	L.5	0	0
For carriages with leſs than four wheels, drawn by one horſe	5	5	0
For carriages drawn by two or more horſes	7	7	0
For every additional body	2	10	0
For carriages with four wheels let out to hire	8	8	0

Every maker of coaches, chaiſes, chariots, &c. muſt, from and after the 5th day of July 1785, take out at the exciſe office in London, or of their agents in the country, a licence, to be renewed annually at leaſt ten days before the expiration of the former, for which they muſt pay 20s. They muſt alſo pay 20s. duty for every four-wheeled carriage newly built for ſale, and 10s. for every two-wheeled carriage. Theſe duties are alſo payable to the commiſſioners of the exciſe in town, or their agents in the country.

Coach-makers in Scotland are to take out their licenſes and pay the duties to the commiſſioners of exciſe in Edinburgh, or their agents in the country of that part of Great Britain.

Every coach-maker neglecting to take out a licence, and renewing the ſame annually, forfeits 10l.; and neglecting or refuſing to ſettle every ſix weeks, in the manner particularly directed by the act, is a forfeiture of 20l.

Hackney-COACHES, thoſe expoſed to hire, in the ſtreets of London, and ſome other great cities, at rates fixed by authority.

One thouſand hackney-coaches are allowed in London and Weſtminſter: which are to be licenſed by commiſſioners, and to pay a duty to the crown. They are all numbered, having their numbers engraved on tin plates fixed on the coach-doors. Their fares or rates are fixed by act of parliament; and by a late act have been increaſed in conſequence of a new weekly tax.

Stage-COACHES are thoſe appointed for the conveyance of travellers from one city or town to another. The maſters of ſtage coaches are not liable to an action for things loſt by their coachmen, who have money given them to carry the goods, unleſs where ſuch maſter takes a price for the ſame.

Perſons keeping any coach, berlin, landau, or other carriage with four wheels, or any calaſh, chaiſe, chair, or other carriage with two wheels, to be employed as public ſtage-coaches or carriages, for the purpoſe of conveying paſſengers for hire to and from different places, ſhall pay annually 5s. for a licence; and no perſon ſo licenſed ſhall by virtue of one licence keep more than one carriage, under the penalty of 10l.

Mail-COACHES are ſtage-coaches of a particular conſtruction to prevent overturns; and for a certain conſideration carry his majeſty's mails, which are protected by a guard, and ſubject to the regulations of the poſt-office. They are punctual as to their time of arrival and departure, are reſtricted to four inſide paſſengers, and from experience have proved very beneficial to the commerce and correſpondence of this country. The late John Palmer, Eſq. who had the merit of the invention, and was indefatigable in bringing the eſtabliſhment to a permanent footing, was greatly patronized by government; and got, as the reward of his ſervice, a handſome appointment in the general poſt-office London.

Coach, or Couch, is alſo a ſort of chamber or apartment in a large ſhip of war near the ſtern. The floor of it is formed by the aftmoſt part of the quarter-deck, and the roof of it by the poop: it is generally the habitation of the captain.

COADUNATE, in *Botany*, an order of plants in the *fragmenta methodi naturalis* of Linnæus, in which he has theſe genera, viz. annona, liriodendrum, magnolia, uvaria, michelia, thea.

COAGULATION, in *Chemiſtry*, is performed by ſix different agents; and by each of theſe in ſeveral different manners. 1. It is performed with water, by congealing, cryſtallizing, and precipitating, as in the mercurius vitæ and ſome other preparations. 2. With oil, which, by the force of fire, unites with ſulphur, ſalts, and metals. 3. With alcohol, upon the ſpirit of ſal ammoniac, the white of eggs, the ſerum of the blood, &c. 4. With acid and alkali growing ſolid together, as in the tartarum vitriolatum. 5. With fixed alkali, as in milk. And, 6. With acid ſalts; as in milk, ſerum, and the whites of eggs.

COAGULUM, is the ſame with what in Engliſh we call *runnet*, or rather the curd formed thereby.

COAKS. For the exciting of intenſe heats, as for the ſmelting of iron ore, and for operations where the acid and oily particles would be detrimental, as the drying of malt, foſſil-coals are previouſly charred, or reduced to *coaks;* that is, they are made to undergo an operation ſimilar to that by which charcoal is made. By this operation coals are deprived of their phlegm, their acid liquor, and part of their fluid oil. Coaks, therefore, conſiſt of the two moſt fixed conſtituent parts, the heavy oil and the earth, together with the acid concrete ſalt, which, though volatile, is diſſolved by the oil and the earth.

COAL, among chemiſts, ſignifies any ſubſtance containing oil, which has been expoſed to the fire in cloſe veſſels, ſo that all its volatile principles are expelled, and that it can ſuſtain a red heat without further decompoſition. Coal is commonly ſolid, black, very dry, and conſiderably hard. The ſpecific character of perfect coal is its capacity of burning with acceſs of air, while it becomes red-hot and ſparkles, ſometimes with a ſenſible flame which gives little light, with no ſmoke or ſoot capable of blackening white bodies.

Coal is capable of communicating its inflammable principle, either to the ſulphuric acid, with which it forms ſulphur; or to the nitrous acid contained in nitre, which it inflames; or to metallic earths, which it reduces into metals. But the phlogiſton cannot paſs from coal to form theſe new combinations without the aſſiſtance of red-heat. Coal ſeems to be an unalterable compound in every inſtance but thoſe mentioned, of burning in the open air, and of communicating its phlogiſton to other bodies: for it may be expoſed in cloſe veſſels to the moſt violent and long-continued fire without ſuffering the leaſt decompoſition. No diſpoſition to fuſe, nor any diminution of weight, can be perceived. It is a ſubſtance exceedingly fixed, and perhaps the moſt refractory in nature. It reſiſts the action of the moſt powerful menſtrua, liver of ſulphur alone excepted. Coal is evidently a reſult of the decompoſition of the compound bodies from which it is obtained. It conſiſts of the greateſt part of the earthy principle of theſe compound bodies, with which a part of the ſaline principles, and ſome of the phlogiſton of the decompoſed oil, are fixed and combined very intimately. Coal can never be formed but by the phlogiſton of a body which has been in an oily ſtate; hence it cannot be formed by ſulphur, phoſphorus, metals, nor by any other ſubſtance the phlogiſton of which is not in an oily ſtate. Alſo every oily matter treated with fire in cloſe veſſels, furniſhes true coal; ſo that whenever a charry reſiduum is left, we may be certain that the ſubſtance employed in the operation contained oil. Laſtly, the inflammable principle of coal although it proceeds from oil, certainly is not oil, but pure phlogiſton, ſince coal added to ſulphuric acid can form ſulphur, to phoſphoric acid can form phoſphorus, &c. and ſince oil can produce none of theſe effects till it has been decompoſed and reduced to the ſtate of coal. Beſides, the phenomena accompanying the burning of coal are different from thoſe which happen when oily ſubſtances are burnt. The flame of charcoal is not ſo bright as that of oil, and produces no flame or ſoot.

All the phlogiſton of coal is not burnt in the open air, particularly when the combuſtion is ſlow. One part of it exhales without decompoſition, and forms a vapour, or an inviſible and inſenſible gas. This vapour (which is, or at leaſt contains a great deal of fixed air) is found to be very pernicious, and to affect the animal ſyſtem in ſuch a manner as to occaſion death in a very ſhort time. For this reaſon it is dangerous to remain in a cloſe place, where charcoal or any other ſort of coal is burnt. Perſons ſtruck by this vapour are ſtunned, faint, ſuffer a violent headach, and fall down ſenſeleſs and motionleſs. The beſt method of recovering them is by expoſure to the open air, and by making them ſwallow vinegar, and breathe its ſteam.

Amongſt coals, ſome differences are obſervable, which proceed from the difference of the bodies from which they are made: ſome coals, particularly, are more combuſtible than others. This combuſtibility ſeems to depend on the greater or leſs quantity of ſaline principle they contain; that is, the more of the ſaline principle it contains, the more eaſily it decompoſes and burns. For example, coals made of plants and wood containing much ſaline matter capable of fixing it, the aſhes of which contain much alkaline ſalt, burn vigorouſly and produce much heat; whereas the coals of animal matters, the ſaline principles of which are volatile, and cannot be fixed but in ſmall quantity, and the aſhes of which contain little or no ſalt, are ſcarcely at all combuſtible. For they not only do not kindle ſo eaſily as charcoal does, nor even burn alone, but they cannot be reduced to aſhes, without very great trouble, even when the moſt effectual methods are uſed to facilitate the combuſtion. The coal of bullocks blood has been kept for ſix hours very red in a ſhallow crucible, ſurrounded by burning charcoal, and conſtantly ſtirred all the time, that it might be totally expoſed to the air; yet could it not be reduced to white, or even gray, aſhes: It ſtill remained very black, and full of phlogiſton. The coals of pure oils, or of concrete oily ſubſtances and ſoot, which is a kind of coal raiſed during inflammation, are as difficultly reduced to aſhes as animal coals. Theſe coals contain very little ſaline matter, and their aſhes yield no alkali. The coals which are ſo difficultly burnt, are alſo leſs capable of inflaming with nitre than others more combuſtible; and ſome of them even in a great meaſure reſiſt the action of nitre.

Coal, in *Mineralogy*, a kind of ſolid inflammable ſubſtance, ſuppoſed to be of a bituminous nature, and commonly uſed for fuel. Of this ſubſtance there are various ſpecies.

1. *Pit-coal (Lithanthrax)*, is a black, ſolid, compact, brittle maſs, of moderate hardneſs, lamellated ſtructure, more or leſs ſhining, but ſeldom capable of a good poliſh; and does no melt when heated. According to Kirwan, it conſiſts of petrol or aſphaltum, intimately mixed with a ſmall portion of earth chiefly argillaceous; ſeldom calcareous; and frequently mixed with pyrites. A red tincture is extracted from it by ſpirit of wine, but cauſtic alkali attacks the bituminous part. From ſome ſorts of it a varniſh may be made by means of fat oils. Fixed alkali has never been found in any kind of it, nor ſulphur, unleſs when it happens to be mixed with pyrites.—None of the various kinds are found to be electrics *per ſe* (A).

The varieties of lithanthrax, enumerated by Cronſtedt, are, 1. With a ſmall quantity of argillaceous earth and ſulphuric acid. It is of a black colour, and ſhining texture: it burns, and is moſtly conſumed in the fire, but leaves, however, a ſmall quantity of aſhes. 2. Slaty coal.

2. *Culm coal*, called *kolm*, by the Swedes, has a greater portion of argillaceous earth and ſulphuric acid, with a moderate proportion of petrol. It has the ſame appearance with the foregoing, though its texture is more dull: it burns with a flame without being conſumed, but leaves behind it a ſlag of the ſame bulk with the original volume of the coal. The following is Mr Kirwan's deſcription of it, from the memoirs of the Stockholm academy. " Its fracture has a rougher ſection than the cannel coal; its ſpecific gravity from 1.300 to 1.370. The beſt kind affords by diſtillation, at firſt fixed air, then an acid liquor, afterwards inflammable air, and a light oil of the nature of petrol; then a volatile alkali; and laſtly pitch-oil. The reſiduum is nearly three quarters of the whole; and being ſlowly burnt, affords 13 per cent. of aſhes, which conſiſt moſtly of argillaceous earth; and about three hundredth parts of them are magnetic. It is found in England, and among ſome aluminous ores in Sweden."

3. *Slate-coal* contains ſuch a quantity of argillaceous earth, that it looks like common ſlate; however, it burns by itſelf with a flame. M. Magellan is of opinion that this is the bituminous ſubſtance already deſcribed. This ſchiſtus is of a dark bluiſh ruſty colour; when thrown on the fire it burns with a lively flame, and almoſt as readily as the oily wood of dry olive-tree, or lignum vitæ; emitting the very diſagreeable ſmell of petrol. Such large quarries of it are found near Purbeck in Dorſetſhire, that the poorer part of the inhabitants are thence ſupplied with fuel. From the appearance of this ſlaty coal, Cronſtedt has been induced to ſuppoſe that the earth of all kinds of coal is argillaceous, though it is not ſo eaſy to diſtinguiſh it after being burnt. The pit-coals, he ſays, contain more or leſs of the ſulphuric acid; for which reaſon the ſmoke ariſing from them attacks ſilver in the ſame manner as ſulphur does, let the coals be ever ſo free from marcaſite, which, however, is often imbibed or mixed with them.

4. *Cannel coal (Ampelites)*, is of a dull black colour; breaks eaſily in all directions; and, if broken tranſverſely, preſents a ſmooth conchoidal ſurface. It burns with a bright lively flame, but is very apt to fly in pieces in the fire; however, it is ſaid to be entirely deprived of this property by immerſion in water for ſome hours previous to its being uſed. It contains a conſiderable quantity of petrol in a leſs condenſed ſtate than other coal. Its ſpecific gravity is about 1.270. This kind of coal, being of an uniform hard texture, is eaſily turned on a lathe, and takes a good poliſh. Hence it is uſed for making various toys, which appear almoſt as well as if made of the fineſt jet.

5. *Kilkenny coal* has a ſpecific gravity equal to 1.400. It contains the largeſt quantity of aſphaltum; burns with leſs ſmoke and flame, and more intenſely, though more ſlowly, than the cannel-coal. The quantity of earth it contains does not exceed one-twentieth part of its weight; but this kind of coal is frequently mixed with pyrites. It is found in the county of Kil-

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(A) " The varieties of this coal (ſays M. Magellan) are very numerous according to the different ſubſtances with which it is mixed; but in regard to their economical uſes, only two kinds are taken notice of by the Britiſh legiſlature, viz. culm and caking coals. The caking coals, in burning, ſhow an incipent fuſion, ſo that their ſmalleſt pieces unite in the fire into one maſs; by which means the ſmalleſt pieces, and even the mere duſt of this kind, are almoſt equally valuable with the largeſt pieces. The other ſort called *culm*, does not fuſe or unite in the fierceſt fire; ſo that the ſmall coal, being unfit for domeſtic purpoſes, can only be uſed in burning limeſtone.

" It ſhould be an eaſy matter for any perſon to diſtinguiſh culm from ſmall caking coal, either by trying to make fire with it in a common grate, without interpoſing any other fuel between it; when if it kindles, it is a caking coal; if not, it is culm: Or by putting ſome of theſe ſmall fragments of coal on an ignited iron ſhovel; if they melt and run together, they belong to the caking kinds; if not, they are culm. But it ſeems that coal merchants are now in the cuſtom of calling *culm* the powdery parts of pit-coal, of whatſoever kind they may happen to be. The reaſon of this is, that there is a difference in the duty payable by culm and by caking coals. There never was any difficulty, however, on the ſubject; nor would there be any difficulty in collecting the tax, were it not for the inſufferable ignorance aud love of deſpotic oppreſſion which generally pervades the underling officers of the revenue."

kenny, belonging to the province of Leinſter in Ireland. The quality of it as burning without ſmoke, is proverbially uſed as an encomium on the county.

6. *Sulphureous coal* conſiſts of the former kinds mixed with a very conſiderable portion of pyrites; whence it is apt to moulder and break when expoſed to the air, after which water will act upon it. It contains yellow ſpots that look like metal; burns with a ſulphureous ſmell, leaving behind it either ſlag or ſulphureous aſhes, or both. Its ſpecific gravity is 1.500 or more.

7. *Bovey coal* (*Xylanthrax*), is of a brown or browniſh-black colour, and of a yellow laminar texture. Its laminæ are frequently flexible when firſt dug, though they generally harden when expoſed to the air. It conſiſts of wood penetrated with petrol or bitumen, and frequently contains pyrites, alum, and vitriol. According to the German chemiſts, its aſhes contain a little fixed alkali; but Mr Mills differs from them on this ſubject. By diſtillation it yields a fetid liquor mixed with a volatile alkali and oil; part of which is ſoluble in alcohol, and part of a mineral nature, and inſoluble. It is found in almoſt all the countries of Europe.

Theſe are the moſt conſiderable varieties of coals commonly known; but we muſt not imagine, that each of them is to be met homogeneous in thoſe places where they are found. On the contrary, the different qualities and proportions of their ingredients make a vaſt number of other varieties, fit for different purpoſes, according to the quality and quantity of thoſe they contain. Thus, various kinds of coals are often found mixed with one another under ground, and ſome of the finer ſorts ſometimes run like veins between thoſe of a coarſe kind. Thus, M. Magellan obſerved in the fine coals employed in a curious manufactory at Birmingham, that they produced a much clearer flame than he had ever obſerved from common coal; yet, on inquiry, he found that theſe were picked out from the common coals of the country, through which they ran in veins, and were eaſily diſtinguiſhed by the manufacturers, though they did not afford ſufficient indications of a ſpecific difference. The purpoſe to which they were applied was the moulding rods of tranſparent and coloured glaſs into the ſhapes proper for common buttons, which they performed with aſtoniſhing expedition.

Fourcroy remarks, that this foſſil bitumen, when heated in contact with a body in combuſtion, and having a free acceſs of air, kindles the more ſlowly and with the greater difficulty in proportion as it is more weighty and compact. When once kindled, it emits a ſtrong and durable heat, and burns for a long time before it is conſumed. The matter that is burned, and produces the flame, appears very denſe, and ſeems united to ſome other ſubſtance which retards its deſtruction. On burning, it emits a particular ſtrong ſmell, which is not at all ſulphureous when the coal contains no pyrites. When the combuſtible, oily, and other volatile parts of the coal are diſſipated, if the combuſtion be then ſtopped, the remainder is found to be reduced to a true charred ſtate, and is called *coak*. This ſubſtance is capable of exciting the moſt intenſe heat, for which purpoſe it is uſed in metallurgic works all over Britain.

"It is well known (ſays M. Magellan,) that the Engliſh method of burning pit coal into *coak* has been a moſt profitable and happy acquiſition for the ſmelting our ores, and for many other metallurgical and chemical proceſſes in this iſland. But the ingenious and advantageous undertaking of Lord Dundonald, by which he turns to a very conſiderable profit the mines of coals in his and other eſtates, building ovens of a proper conſtruction for burning pit coal into coak, and at the ſame time for collecting, in ſeparate receptacles, the volatile alkali, oil, tar, and pitch, which were generally loſt by the uſual method, deſerves to be noticed, as it affords a very remarkable inſtance of the great loſſes to mankind, for want of carefully attending to every reſult from great proceſſes of art when made on a large ſcale. Theſe ovens are ſo contrived, as to admit an under ſupply of air; and the coals, after being kindled, decompoſe themſelves by a ſlow but incomplete combuſtion, which does not deſtroy the ingredients. The reſiduum left in the oven proves to be moſt excellent cinders or coaks; whilſt the volatile parts, which otherwiſe would be diſſipated in the air, are ſeparated and condenſed in reſervoirs, or receptacles of capacious ſize, placed at proper diſtances beyond the reach of fire. Monſ. Faujas de St Fond, who viſited theſe works in a journey he made to Scotland, undertook to erect a ſimilar kind of oven in France; and it is rather ſingular, that he endeavours to eſtabliſh a claim of having diſcovered the ſame proceſſes before he ſaw them in Scotland, as if it did not reflect a greater honour on his induſtry, to carry back to his country ſome uſeful knowledge, than to return as ignorant as our Engliſh travellers," &c.

On ſubjecting pit-coal of any kind to diſtillation in cloſe veſſels, it firſt yields a phlegm or watery liquor, then an ethereal or volatile oil, afterwards a volatile alkali, and laſtly, a thick and greaſy oil; but it is remarkable, that, by rectifying this laſt oil, a tranſparent thin and light oil of a ſtraw colour is produced, which being expoſed to the air becomes black like animal oils. From this and other obſervations, the general opinion is, that coals, bitumens, and other oily ſubſtances found in the mineral kingdom, derive their origin from vegetables buried in the earth, ſince it is well known that only organized bodies have the power of producing oily and fat ſubſtances. "The amazing irregularities, gaps, and breaks (ſays M. Magellan) of the ſtrata of coals, and of other foſſil ſubſtances, evince that this globe has undergone the moſt violent convulſions, by which its parts have been broken, detached and overturned in different ways, burying large tracts of their upper ſurfaces, with all the animal and vegetable productions there exiſting, at the time of thoſe horrible cataſtrophes, whoſe epoch far precedes all human records. And it is eaſy to be conceived, that the various heaps and congeries of theſe vegetable and animal ſubſtances, remaining for ages and ages in the bowels of the earth, have obtained various conſiſtencies, and ſtill produce thoſe oily and bituminous juices, which find way to guſh out, leaving behind their thickeſt parts on the ſame places where they are found, and in many others where the induſtry of mankind never will be able to penetrate."

Coal-Mine. See Coalery. Maliciouſly ſetting fire to coal-mines is felony, by ſtat. 10 Geo. II. c. 32. § 6.

Small Coal, a ſort of charcoal prepared from the ſpray and bruſhwood, ſtripped off from the branches of coppice wood, ſometimes bound in bairns for that purpoſe, and ſometimes charred without binding, in which caſe it is called "coming it together."

1
Hiſtory of coals.

COALERY, Coaliery, or Colliery; a coal-work, or place where Coals are dug.

It is generally agreed, that our cannel-coal * is the lapis ampelites of the Romans, though it ſeems to have been uſed by them only for making toys, bracelets, &c. But of that common fuel which we denominate *coals*, the native Romans were entirely ignorant. It is certain that they are not, as ſome have imagined, the lapis obſidianus of Pliny, about which there have been great diſputes†: nor the Gagates, or Jet, which, others, again, have taken for the *lapis obſidianus*; though the lightneſs and texture ſhow plainly that it is not either ſtone or coal. In fact, there are no beds of it in the compaſs of Italy. The great line of that fuel ſeems to ſweep away round the globe, from north-eaſt to ſouth-weſt; not ranging at a diſtance even from the ſouth-eaſterly parts of our iſland, as is generally imagined, but actually viſiting Brabant and France, and yet avoiding Italy.

Auguſtus placed the ſtatues of four elephants made of it in the temple of Concord.

But the primæval Britons appear to have uſed it. And in the precincts of Mancheſter particularly, which are furniſhed with an inexhauſtible abundance of it, they could not have remained unappriſed of the agreeable combuſtible around them. The currents there frequently bring down fragments of coal from the mountains; and in the long and winding courſe of them through the pariſh, the Britons would ſoon mark the ſhining ſtones in the channels; and by the aid of accident, or the force of reflection, find out the utility of them. But we can advance ſtill nearer to a certainty. Several pieces of coal were diſcovered ſome years ago in the ſand under the Roman way to Ribcheſter, when both were dug up at the conſtruction of a houſe in Quay-ſtreet. The number of pieces, ſeveral of them as large as eggs, was not leſs than 40; and a quantity of ſlack was dug up with them. Theſe circumſtances ſhow the coals to have been lodged upon the ſpot before the road of the Romans covered it. That ground being in the neighbourhood of *Mancenion* ‡, the Britons had there repoſited a quantity of coals, probably for the uſe of the garriſon; and many of the ſmaller fragments, and ſome of the ſlack, were buried in the ſand upon which they were laid. And that the Britons in general were acquainted with this fuel, is evident from its appellation amongſt us at preſent, which is not Saxon, but Britiſh; and ſubſiſts among the Iriſh in their *O gual*, and among the Corniſh in their *kolan*, to this day.

Whitaker's Hiſtory of Mancheſter.

The extenſive beds of fuel, therefore, with which the kingdom of England and the precincts of Mancheſter are ſo happily ſtored, were firſt noticed by the ſkill, and firſt opened by the labour of the Britons; and ſome time before the arrival of the Romans among us. And the nearer quarries in the confines of Bradford, Newton, and Mancheſter, would naturally attract the notice, and invite the inquiries of the Britons, before any others. The current of the Medlock, which waſhes the ſides of them, would bring down ſpecimens of the riches within, lodge many of them about the Caſtleſield, and allure the Britons ſucceſſively to a collection of the one, and a ſearch after the other.

But, even for ages after the diſcovery, wood continued to compoſe the general fuel of the nations. In 852, a grant was made of ſome lands by the abbey of Peterborough, under the reſervation of certain boons and payments in kind to the monaſtery; as, one night's entertainment; 10 veſſels of Welſh and two of common ale; 60 cart-loads of wood, and 12 of pit-coal; where we ſee the quantity of coal was only one cart-load to five of wood. The latter naturally continued the principal article of our fuel as long as the foreſts and thickets preſented themſelves ſo ready to the hand; and ſuch it continued till a very late period. The firſt public notice of the former is mentioned by Mr Hume to have been in the time of Henry III. who, in the year 1272, granted a charter to the town of Newcaſtle, giving the inhabitants a licenſe to dig coals; and the firſt ſtatute relating to this article was the 9th Henry V. c. 10. ordaining all keels in the port of Newcaſtle to be meaſured by commiſſioners, before carriage of coals, on pain of forfeiture. They were not brought into common uſe till the reign of Charles I.; and were then ſold for about 17s. a chaldron. In ſome years after the reſtoration, there were about 200,000 chaldrons burnt in London; in 1670, about 270,000 chaldrons; at the revolution, upwards of 300,000 chaldrons; and at preſent, full 600,000 are annually conſumed there. There is, beſides, an immenſe conſumption in other parts of Britain, and in Ireland. In Scotland, they ſupply their own conſumption, and alſo export. In Ireland, though they have coal, yet they take annually to the value of 30,000l. from England, and 12,000l. from Scotland.

Campbell's Political Survey.

The moſt remarkable coalery, or coal-work, that we have ever had in this iſland, was that wrought at Borrowſtounneſs, under the ſea. The veins of coal were found to continue under the bed of the ſea in this place, and the colliers had the courage to work the vein near half way over; there being a mote half a mile from the ſhore, where there was an entry that went down into the coal-pit, under the ſea. This was made into a kind of round quay or mote, as they call it, built ſo as to keep out the ſea, which flowed there twelve feet. Here the coals were laid, and a ſhip, of that draught of water, could lay her ſide to the mote, and take in the coal.—This famous coalery belonged to the Earl of Kincardine's family. The freſh water which ſprung from the bottom and ſides of the coal-pit, was always drawn out upon the ſhore by an engine moved by water, that drew it forty fathoms. This coal-pit continued to be wrought many years to the great profit of the owners, and the wonder of all that ſaw it; but, at laſt, an unexpected high tide drowned the whole at once: the labourers had not time to eſcape, but periſhed in it.

There are ſeveral other countries in Europe which poſſeſs conſiderable coal-mines; as France, Liege, Germany, and Sweden. Alſo on the other ſide of the Atlantic ocean, there has been coal diſcovered, and wrought; in Newfoundland, Cape-Breton, Canada, and ſome of the New England provinces. But in all theſe countries, the coal is of a quality much inferior to the Britiſh, and entirely unfit to be uſed in many manufactures;

2
Excellence of the Bri-
tiſh coals.

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* See *Ampelites*.

† L. xxxvi. cap. 26.

‡ i. e. "the place of tents." An ancient Britiſh town, the ſite of which was the preſent Caſtlefield at Mancheſter.

manufactures; ſo that they are obliged to import great quantities from Britain for the uſe of their manufactures of iron, &c.

3
mportance ſ the coal-rade.

Our inland coal-trade, that is, carrying coals from Newcaſtle, Sunderland, Blith, and other adjacent places in the north of England, as alſo from the frith of Edinburgh in Scotland, and other places adjacent, to the city of London, and to the port towns on the coaſt all the way, as well on this ſide of Newcaſtle, north, as up the channel as high as Portſmouth weſt, is a prodigious article, and employs abundance of ſhipping and ſeamen; inſomuch that, in a time of urgent neceſſity, the coalery navigation alone has been able to ſupply the government with a body of ſeamen for the royal navy, able to man a conſiderable fleet at a very ſhort warning, and that without difficulty, when no other branch of trade could do the like. Likewiſe the Whitehaven coaleries in Cumberland, belonging to Sir James Lowther, furniſh ſeveral counties in Ireland with coals, and conſtantly employ upwards of 2000 ſeamen; which alſo is a noble nurſery for the navy of this kingdom. And not only do the pit-coals ſufficiently ſupply all the ports, but, by means of thoſe ports and the navigable rivers, all the adjacent counties very far inland.

In ſhort, coals, though not an excluſive, yet may, with propriety, be ſtyled a peculiar bleſſing to Britain, from their great plenty, their acknowledged excellence, and their being found in ſuch places as are conveniently ſituated for exportation. Nor is there any danger of the export trade being leſſened even by the ſeveral duties that have been laid upon them; for the foreign conſumpt being founded in neceſſity with regard to manufactures, and in economy where they are uſed for convenience (wood and turf being dearer than coals with the duty), we need be in no fear of the markets declining. There is as little room to be alarmed from an apprehenſion of their being exhauſted, as the preſent works are capable of ſupplying us for a long ſeries of years, and there are many other mines ready to be opened when theſe ſhall fail. Beſides, there are known to be coals in many parts of the three kingdoms, which hitherto they have had no encouragement to work.

Beſides the value of this commodity as a conveniency of life, as an article of commerce, and as giving riſe to a nurſery of ſeamen for the increaſe of the marine; other important advantages deſerve to be noticed. Coals are in many reſpects, and in a very high degree, uſeful to the landed intereſt; not only by raiſing exceedingly the real value, and of courſe the purchaſe, of thoſe lands in which they are found, and thoſe through which it is neceſſary to paſs * from the works to the places where they are embarked, but from the general improvements they have occaſioned; ſo that very few counties are now better cultivated than Northumberland, and the ſame effects they have had in a greater or leſs degree in other places. Thouſands of laborious people are employed in and about the mines; thouſands more in conveying them to the ports, and on board the ſhips; to ſay nothing of thoſe that draw their ſubſiſtence from the carriage of them by land to ſupply families, &c. There are alſo great numbers that live in a ſuperior ſtation; as ſtewards, directors, factors, agents, book-keepers, &c. To theſe we may add the extraordinary encouragement given to ingenious artiſts who have invented, and the numerous workmen continually employed about thoſe ſeveral curious and coſtly machines which, for a variety of purpoſes in this buſineſs, are in continual uſe, and of courſe in continual wear; we may join to theſe the multitudes that obtain their living from the many manufactures in which they are employed, and which could not be carried on but by the help and cheapneſs of coals. Laſtly, the produce of coals exported, which amounts to a very conſiderable ſum, beſides being profitable to the owners, merchants, and mariner, is ſo much clear gain to the nation.

It might be expected, that a trade ſo beneficial to individuals, and to the nation in general, and which has been gradually increaſing for ſeveral centuries paſt, would have been advanced by this time to very great perfection, and reduced to a regular ſyſtem. But, in one very eſſential reſpect, it is found to be quite otherwiſe. The art of working coal-mines in the moſt profitable manner is indeed highly improved; but the fundamental of the art, that of ſearching for and diſcovering coal in any diſtrict of country where it has not yet been found, has never, that we know of, been treated in a ſyſtematic manner. The reader, therefore, will not be diſpleaſed to find this defect ſupplied in the courſe of the preſent article, together with a detail of all the other operations in the buſineſs of coaleries.

4
Situation of the ſtrata.

The terreſtrial matters which compoſe the ſolid parts of the earth are diſpoſed in ſtrata, beds, or layers, the under ſurface of one bearing againſt or lying upon the upper ſurface of that below it, which laſt bears or lies on the next below in the ſame manner.

Theſe ſtrata conſiſt of very different kinds of matter, ſuch as free-ſtone, lime-ſtone, metal-ſtone or whinſtone, coal, &c. as will be particularly ſpecified in the ſequel.

Some of theſe ſtrata are of a conſiderable thickneſs, being often found from 100 to 200 feet or upwards, nearly of the ſame kind of matter from the ſuperior to the inferior ſurface; and others are found of the leaſt thickneſs imaginable, one inch or leſs.

All theſe ſtrata are divided or parted from each other laterally, either by their even, ſmooth, poliſhed ſurfaces, with very thin lamina of ſoft or duſty matter betwixt them, called *the parting*, which renders them eaſy to ſeparate; or elſe only by the ſurfaces cloſely conjoined to each other, without any viſible matter interpoſed betwixt them: yet the different ſubſtance of each ſtratum is not in the leaſt intermixed, though ſometimes they adhere ſo ſtrongly together, that it is very difficult to part or disjoin them: in this laſt caſe they are ſaid to have *a bad parting*.

Beſides this principal diviſion or parting laterally, there are, in ſome ſtrata, ſecondary diviſions or partings alſo laterally, ſeparating or approaching towards a ſeparation, of the ſame ſtratum, into parts of different thickneſſes, nearly parallel to each other, in the ſame manner as the principal partings divide the different ſtrata from each other: but theſe ſecondary ones are not ſo ſtrong or viſible, nor make ſo effectual a parting, as the principal ones do; and are only met with in ſuch ſtrata, as are not of an uniform hardneſs, texture, or colour, from the upper to the under ſurface.

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* Theſe are nphati-lly ſtyled *ay-leaves*, d are let as high nts as any nded property in ritain.

There are other diviſions or partings, called *backs*, in almoſt every ſtratum, which croſs the former lateral ones longitudinally, and cut the whole ſtratum through its two ſurfaces into long rhomboidal figures. Theſe again are croſſed by others called *cutters*, running either in an oblique or perpendicular direction to the laſt mentioned backs, and alſo cut the ſtratum through its two ſurfaces. Both theſe backs and cutters generally extend from the upper or ſuperior ſtratum down through ſeveral of the lower ones; ſo that theſe backs and cutters, together with the lateral partings before mentioned, divide every ſtratum into innumerable cubic, priſmatic, and rhomboidal figures, according to the thickneſs of the ſtratum, and the poſition and number of the backs and cutters. They ſometimes have a kind of thin partition of duſty or ſoft matter in them, and ſometimes none, like the firſt mentioned partings; but the ſofter kind of ſtrata generally have more backs and cutters than the harder kind, and they do not extend or penetrate through the others.

Plate CXLIX.

To explain this a little further, let A, B, C, D, E, F, G, (fig. 1.) repreſent the principal partings before mentioned, or the upper and under ſurfaces of any ſtratum; then *a*, *b*, *c*, *d*, *e*, *f*, will repreſent the ſecondry lateral partings nearly parallel to the principal ones; *g*, *h*, *i*, *k*, *l*, *m*, the longitudinal partings called *backs*; *n*, *o*, *p*, *q*, *r*, *s*, the croſs partings called *cutters*, croſſing the laſt mentioned ones either obliquely or perpendicular.

In all places where the ſtrata lie regular, they are divided and ſubdivided in the manner above mentioned; and ſometimes in this manner extend through a pretty large diſtrict of country; though it is often otherwiſe; for their regularity is frequently interrupted, and the ſtrata broken and diſordered, by ſundry chaſms, breaches, or fiſſures, which are differently denominated according to their various dimenſions, and the matters with which they are filled, viz. dikes hitches, and troubles, which ſhall be explained in order.

5 Dikes.

Dikes are the largeſt kind of fiſſures. They ſeem to be nothing but a crack or breach of the ſolid ſtrata, occaſioned by one part of them being broken away and fallen from the other. They generally run in a ſtraight line for a conſiderable length, and penetrate from the ſurface to the greateſt depth ever yet tried, in a direction ſometimes perpendicular to the horizon, and ſometimes obliquely. The ſame kind of ſtrata are found lying upon each other in the ſame order, but the whole of them greatly elevated or depreſſed, on the one ſide of the dike as on the other. Theſe fiſſures are ſometimes two or three feet wide, and ſometimes many fathoms. If the fiſſure or dike be of any conſiderable width, it is generally filled with heterogeneous matter, different from that of the ſolid ſtrata on each ſide of it. It is ſometimes found filled with clay, gravel, or ſand; ſometimes with a confuſed maſs of different kinds of ſtone lying edgeways; and at other times with a ſolid body of free-ſtone, or even whin ſtone. When the fiſſure is of no great width, as ſuppoſe two or three feet only, it is then uſually found filled with a confuſed mixture of the different matters which compoſe the adjoining ſtrata, conſolidated into one maſs. If the dike runs or ſtretches north and ſouth, and the ſame kind of ſtrata are found on the eaſt ſide of the dike, in a ſituation with reſpect to the horizon 10 or 20 fathoms lower than on the other ſide, it is then ſaid to be a *dip-dike* or *downcaſt-dike* of 10 or 20 fathoms to the eaſtward; or counting from the eaſt ſide, it is then ſaid to be a *riſe-dike* or *upcaſt* of ſo many fathoms weſtward. If the ſtrata on one ſide are not much higher or lower with reſpect to the horizontal line, than thoſe on the other, but only broken off and removed to a certain diſtance, it is then ſaid to be a dike of ſo many fathoms thick, and from the matter contained between the two ſides of the fiſſure or dike, it is denominated a *clay-dike*, *ſtone-dike*, &c.

6 Hitches.

A *hitch* is only a dike or fiſſure of a ſmaller degree, by which the ſtrata on one ſide are not elevated or ſeparated from thoſe on the other ſide above one fathom. Theſe hitches are denominated in the ſame manner as dikes, according to the number of feet they elevate or depreſs the ſtrata.

There are dikes (though they are not often met with in the coal-countries) whoſe cavities are filled with ſparr, the ores of iron, lead, vitriol, or other metallic or mineral matters; and it is pretty well known, that all metallic veins are nothing elſe than what in the coal countries are called *dikes*.

The ſtrata are generally found lying upon each other in the ſame order on one ſide of the dike as on the other, as mentioned above, and nearly of the ſame thickneſſes, appearing to have been originally a continuation of the ſame regular ſtrata, and the dike only a breach by ſome later accident, perpendicularly or obliquely down through them, by which one part is removed to a ſmall diſtance, and depreſſed to a lower ſituation than the other. But this is not the only alteration made in the ſtrata by dikes; for generally to a conſiderable diſtance on each ſide of the dike, all the ſtrata are in a kind of ſhattered condition, very tender, eaſily pervious to water, and debaſed greatly in their quality, and their inclination to the horizon often altered.

7 Troubles

Troubles may be denominated dikes of the ſmalleſt degree; for they are not a real breach, but only a tendency towards it, which has not taken a full effect. The ſtrata are generally altered by a trouble from their regular ſite to a different poſition. When the regular courſe of the ſtrata is nearly level, a trouble will cauſe a ſudden and conſiderable aſcent or deſcent; where they have, in their regular ſituation, a certain degree of aſcent or deſcent, a trouble either increaſes or alters it to a contrary poſition: and a trouble has theſe effects upon the ſtrata in common with dikes, that it greatly debaſes them from their original quality; the partings are ſeparated; the backs and cutters disjoined, and their regularity diſordered; the original cubic and priſmatic figures, of which the ſtrata were compoſed, are broken, the diſlocation filled with heterogeneous matter, and the whole ſtrata are reduced to a ſofter and more friable ſtate.

The ſtrata are ſeldom or never found to lie in a true horizontal ſituation; but generally have an inclination or deſcent, called the *dip*, to ſome particular part of the horizon. If this inclination be to the eaſtward,

ward, it is called an *eaſt dip*, and a *weſt riſe*; and according to the point of the compaſs to which the dip inclines, it is denominated, and the aſcent or riſe is to the contrary point. This inclination or dip of the ſtrata is found to hold everywhere. In ſome places, it varies very little from the level; in others, very conſiderably; and in ſome ſo much, as to be nearly in a perpendicular direction: but whatever degree of inclination the ſtrata have to the horizon, if not interrupted by dikes, hitches, or troubles, they are always found to lie in the firſt regular manner mentioned. They generally continue upon one uniform dip until they are broken or diſordered by a dike, hitch, or trouble, by which the dip is often altered, ſometimes to a different part of the horizon, and often to an oppoſite point; ſo that on one ſide of a dike, hitch, or trouble, if the ſtrata have an eaſt dip, on the other ſide they may have an eaſt riſe, which is a weſt dip; and in general, any conſiderable alteration in the dip is never met with, but what is occaſioned by the circumſtances laſt mentioned.

8
ip and
iſe of the
trata.

Plate CXLIX.

To illuſtrate what has been ſaid, ſee fig. 2. where *a*, *b*, *c*, *d*, &c. repreſent a courſe of ſtrata lying upon each other, having a certain inclination to the horizon. AB, is a downcaſt-dike, which depreſſes the ſtrata obliquely to *e*, *f*, *g*, *h*, &c. lying upon each other in the ſame order, but altered in their inclination to the horizon. CD repreſents a clay or freeſtone dike, where the ſtrata are neither elevated nor depreſſed, but only broken off and removed to a certain diſtance. EF, repreſents a hitch, which breaks off and depreſſes the ſtrata only a little, but alters their inclination to the horizon. GH, repreſents a trouble, where the ſtrata on one ſide are not entirely broken off from thoſe on the other, but only in a cruſhed and irregular ſituation.

As ſome particular ſtrata are found at ſome times to increaſe, and at other times to diminiſh, in their thickneſſes, whilſt others remain the ſame, conſequently they cannot be all parallel; yet this increaſe and diminution in their thickneſſes come on very gradually.

The ſtrata are not found diſpoſed in the earth according to their ſpecific gravities; for we often find ſtrata of very denſe matter near the ſurface, and perhaps at 50 or even 100 fathoms beneath, we meet with ſtrata of not half the ſpecific gravity of the firſt. A ſtratum of iron ore is very often found above one of coal, though the former has twice the gravity of the latter; and, in ſhort, there is ſuch an abſolute uncertainty in forming any judgment of the diſpoſition of the ſtrata from their ſpecific gravities, that it cannot in the leaſt be relied upon.

It has been imagined by many, that hills and vallies are occaſioned by thoſe breaches in the ſtrata before mentioned called *dikes*; but this is contradicted by experience. If it was ſo, we ſhould meet with dikes at the ſkirts of the hills, and by the ſides of vallies, and the ſea-ſhore; but inſtead of that, we generally find the ſtrata lying as uniformly regular under hills and vallies, and beneath the bottom of the ſea (as far as has been yet tried), as in the moſt champaign countries. It may happen, indeed, that a dike is met with in ſome of theſe places; but that being only a caſual circumſtance, can never be admitted as a general cauſe. Whatever irregularities are occaſioned in the ſolid ſtrata by dikes, or other breaches, are commonly covered over and evened by thoſe beds of gravel, clay, ſand, or ſoil, which lie uppermoſt, and form the outward ſurface of the earth. Wherever theſe ſofter matters have been carried off, or removed by accident, as on the tops of hills and the ſides of vallies, there the ſolid ſtrata are expoſed, and the dip, riſe, and other circumſtances of them may be examined; but no certain concluſions can be drawn, merely from the unevenneſs and inequalities of the outward ſurface.

The preceding obſervations, upon the general diſpoſition of the ſolid ſtrata, are equally applicable to the ſtrata of coal as to thoſe of ſtone or other matter.

9
Deſcription of the ſtrata connected with coal.

We ſhall next give an account of the ſeveral ſtrata of coal, and of ſtone, and other matters, which are uſually connected with coal, and are found to have a particular affinity with it; and, for the ſake of diſtinction, ſhall arrange them into ſix principal claſſes, which will include all the varieties of ſtrata that have been found to occur in all thoſe diſtricts of country, both in Scotland and England, where coal abounds.

1. *Of Whin-ſtone.*] The ſtrata of what is denominated whin-ſtone are the hardeſt of all others; the angular pieces of it will cut glaſs; it is of a very coarſe texture, and when broken acroſs the grain, exhibits the appearance of large grains of ſand half vitrified; it can ſcarcely be wrought, or broken in pieces, by common tools, without the aſſiſtance of gunpowder; each ſtratum is commonly homogeneous in ſubſtance and colour, and cracked in the rock to a great depth. The moſt common colours of theſe ſtrata are black or dark blue, yet there are others of it aſh-coloured and light brown. Their thickneſs in all the coal countries is but inconſiderable, from ſix or five feet down to a few inches; and it is only in a few places they are met with of theſe thickneſſes. In the air it decays a little, leaving a brown powder; and in the fire it cracks, and turns reddiſh brown. Limeſtone, and what is called *baſtard limeſtone*, is ſometimes, though rarely, met with in coaleries. It is a well known ſtone; but from its reſemblance in hardneſs and colour is often miſtaken for a kind of whin. Sometimes, particularly in hilly countries, the ſolid matter next the ſurface is found to be a kind of ſoft or rotten whin;—but it may be noted, that this is only a maſs of heterogeneous matter diſpoſed upon the regular ſtrata; and that beneath this, all the ſtrata are generally found in as regular an order as where this heterogeneous matter does not occur.

2. *Of Poſt-ſtone.*] This is a freeſtone of the hardeſt kind, and next to the limeſtone with reſpect to hardneſs and ſolidity. It is of a very fine texture; and when broken appears as if compoſed of the fineſt ſand. It is commonly found in a homogeneous maſs, though variegated in colour; and, from its hardneſs, is not liable to injury from being expoſed to the weather. Of this kind of ſtone there are four varieties, which may be diſtinguiſhed by their colour. The moſt common is white poſt, which in appearance is like Portland ſtone, but conſiderably harder; it is ſometimes variegated with ſtreaks or ſpots of brown, red, or black.

Gray poſt is alſo very common; it appears like a mixture of fine black and white ſand: it is often variegated with brown and black ſtreaks; the laſt mentioned

tioned appear like ſmall clouds compoſed of particles of coal.

Brown or yellow poſt is often met with of different degrees of colour; moſt commonly of the colour of light ochre or yellow ſand. It is as hard as the reſt, and ſometimes variegated with white and black ſtreaks.

Red poſt is generally of a dull red colour: this is but rarely met with; it is often ſtreaked with white or black.

All theſe lie in ſtrata of different thickneſſes; but commonly thicker than any other ſtrata whatever: they are ſeparated from each other, and from other kinds of ſtrata, by partings of coal, ſand, or ſoft matter of different colours which are very diſtinguiſhable.

3. *Of Sand-ſtone.*] This is a freeſtone of a coarſer texture than poſt, and not ſo hard; is ſo lax as to be eaſily pervious to water; when broken, is apparently of a coarſe ſandy ſubſtance; is friable and moulders to ſand when expoſed to the wind and rain; has frequently white ſhining ſpangles in it, and pebbles or other ſmall ſtones encloſed in its maſs. Of this, there are two kinds commonly met with, diſtinguiſhed by their colours, gray and brown, which are of different ſhades, lighter or darker in proportion to the mixture of white in them. It is moſt generally found in ſtrata of conſiderable thickneſs, without many ſecondary partings; and ſometimes, though rarely, it is ſubdivided into layers as thin as the common gray ſlate. It has generally ſandy or ſoft partings.

4. *Of Metal-ſtone.*] This is a tolerably hard ſtratum, being in point of hardneſs next to ſand-ſtone; generally ſolid, compact, of conſiderable weight, and of an argillaceous ſubſtance, containing many nodules or balls of iron ore, and yellow or white pyrites; its partings, or the ſurfaces of its ſtrata, are hard, poliſhed, and ſmooth as glaſs. When broken, it has a dull duſky appearance (though of a fine texture), like hard dried clay mixed with particles of coal. Though hard in the mine or quarry, when expoſed to the freſh air it falls into very ſmall pieces. The moſt uſual colour of this ſtone is black; but there are ſeveral other lighter colours, down to a light brown or gray. It is eaſily diſtinguiſhed from freeſtone by its texture and colour, as well as by its other characteriſtics. It lies in ſtrata of various thickneſſes, though ſeldom ſo thick as the two laſt-mentioned kinds of ſtone.

5. *Of Shiver.*] This ſtratum is more frequently met with in coaleries than any other. There are many varieties of it, both in hardneſs and colour; but they all agree in one general characteriſtic. The black colour is moſt common; it is called by the miners *black ſhiver*, *black metal*, or *bleas*. It is ſofter than metal-ſtone, and in the mine is rather a tough than a hard ſubſtance, is not of a ſolid or compact matter, being eaſily ſeparable, by the multitude of its partings, &c. into very ſmall parts, and readily abſorbing water. The ſubſtance of this ſtratum is an indurated bole, commonly divided into thin laminæ of unequal thickneſſes, which break into long ſmall pieces when ſtruck with force; and, on examination, they appear to be ſmall irregular rhomboids: each of theſe ſmall pieces has a poliſhed glaſſy ſurface; and, when broken acroſs the grain, appears of a dry, leafy, or laminated texture, like exceedingly fine clay: it is very friable; feels to the touch like an unctuous ſubſtance; and diſſolves in air or water to a fine pinguid black clay. There are almoſt conſtantly found incloſed in its ſtrata lumps or nodules of iron ore, often real beds of the ſame.

There are other colours of this ſtratum beſides black. The brown or dun ſhiver is very frequently met with; it agrees with the above deſcription in every thing but colour. Gray ſhiver is alſo very common: it ſeems to be only a mixture of the black and dun; and by the different degrees of mixture of theſe colours others are produced. It lies in ſtrata ſometimes of conſiderable thickneſs, at other times not exceeding a few feet: they are commonly parted from each other by laminæ of ſpar, coal, or ſoft matter.

6. *Of Coal*] Referring the reader, for the ſcientific diviſion of coals, to MINERALOGY, and the preceding articles, we ſhall here conſider them as diſtinguiſhable into three kinds, according to their degrees of inflammability.

1. The leaſt inflammable kinds are thoſe known by the name of *Welſh coal*, which is found in Wales; Kilkenny coal, which is found near Kilkenny in Ireland; and *blind* or *deaf coal*, which is found in many parts of Scotland and England. This coal takes a conſiderable degree of heat to kindle it, but when once thoroughly ignited will burn a long time; it remains in the fire in ſeparate pieces without ſticking together or caking; it produces neither flame nor ſmoke, and makes no cinder, but burns to a white ſtony flag: it makes a hot glowing fire like charcoal or cinders, and emits effluvia of a ſuffocating nature, which renders it unfit for burning in dwelling-houſes, its chief uſe being among maltſters, dyers, &c. for drying their commodities. 2. *Open burning coal*, ſoon kindles, making a hot pleaſant fire, but is ſoon conſumed: it produces both ſmoke and flame in abundance; but lies open in the fire, and does not cake together ſo as to form cinders, its ſurface being burnt to aſhes before it is thoroughly calcined in the midſt; from this it has its name of an *open burning coal;* it burns to white or brown aſhes very light. Of this kind is cannel-coal, jett, parrot, ſplint, and moſt of the coals in Scotland. 3. *Cloſe burning coal*, kindles very quickly, makes a very hot fire, melts and runs together like bitumen, the very ſmalleſt culm making the fineſt cinders, which being thoroughly burnt, are porous and light as a pumice ſtone, and when broken are of a ſhining lead colour; it makes a more durable fire than any other coal, and finally burns to brown or reddiſh coloured heavy aſhes. Of this kind are the Newcaſtle and ſeveral other of the Engliſh coals, and the ſmithy coals of Scotland. The open and the cloſe burning coal mixed together, make a more profitable fire for domeſtic uſes than either of them ſeparate.

In all thoſe diſtricts of country where coal is found, there are generally ſeveral ſtrata of it; perhaps all the different kinds above mentioned will be found in ſome, and only one of the kinds in others; yet this one kind may be divided into many different ſeams or ſtrata, by beds of ſhiver or other kinds of matter interpoſing, ſo as to give it the appearance of ſo many ſeparate ſtrata.

10 he order n which hey lie.

All theſe ſtrata above deſcribed, with their ſeveral varieties, do not lie or bear upon each other in the order in which they are deſcribed, nor in any certain or invariable order. Though there be found the ſame kinds of ſtrata in one coalery or diſtrict as in another, yet they may be of very different thickneſſes. In ſome places there are moſt of the hard kinds, in others moſt of the ſofter; and in any one diſtrict it rarely happens that all the various kinds are found; for ſome kinds, perhaps, occur only once or twice, whilſt others occur 10 or 20 times before we reach the principal ſtratum of coal.

Plate CXLIX.

In order to explain this, ſuppoſe the ſtrata in the pit at A (fig. 2.) lie in the order *a*, *b*, *c*, *d*, &c. they may be ſo much altered in their thickneſſes, by reaſon of ſome of them increaſing and others diminiſhing, at the diſtance of B, that they may be found there of very different thickneſſes; or if they are examined in a pit at D, by reaſon of its lower ſituation, and the ſtrata there not being a continuation of thoſe in the other places, they may be very different both in their order and thickneſſes, and yet of the ſame kinds.

Though they be thus found very different in one coalery or diſtrict from what they are found to be in another, with reſpect to their thickneſſes, and the order in which they lie upon each other, yet we never meet with a ſtratum of any kind of matter but what belongs to ſome of thoſe above deſcribed.

To illuſtrate how the various ſtrata lie in ſome places, and how often the ſame ſtratum may occur betwixt the ſurface and the coal, we ſhall give the following example. The numbers in the left-hand column refer to the claſſes of ſtrata before deſcribed, to which each belongs. The ſecond column contains the names of the ſtrata; and the four numeral columns to the right hand, expreſs the thickneſs of each ſtratum, in fathoms, yards, feet, and inches.

EXAMPLE.

N°		Fas	Yds	Ft.	Ins.
	Soil and gravel - - -	0	1	1	0
	Clay mixed with looſe ſtones -	1	1	0	0
3	Coarſe brown ſand-ſtone, with ſoft partings - - - - - -	3	0	2	6
2	White poſt, with ſhivery partings	1	1	0	5
5	Black ſhiver or bleas, with iron-ſtone balls	2	0	2	0
6	Coarſe ſplinty coal - - -	0	0	2	6
5	Soft gray ſhiver - - -	0	1	0	7
2	Brown and gray poſt, ſtreaked with black	1	0	2	0
5	Black ſhiver, with beds and balls of iron-ſtone, - - - -	0	1	2	6
4	Gray and black metal-ſtone -	0	1	1	9
2	White and brown poſt - -	1	1	0	0
5	Black and gray ſhiver, ſtreaked with white	0	1	0	6
3	Soft gray ſand-ſtone, with ſhivery partings	0	1	1	0
2	Yellow and white poſt, with ſandy partings	1	0	2	0
5	Black and dun ſhiver, with iron-ſtone balls	0	1	2	6
2	White poſt ſtreaked with black, and black partings - - -	1	0	0	6
5	Gray shiver, with iron-ſtone balls	0	1	0	9
4	Brown and black metal-ſtone -	1	1	2	6
5	Hard ſlaty black shiver - -	1	1	0	0
6	Coal, hard and fine ſplint - -	0	0	3	6
5	Soft black shiver - - -	0	0	0	3
6	Coal, fine and clear - - -	0	0	3	3
5	Hard black shiver - - -	0	0	1	0
	Total Fathoms	25	0	0	0

In this inſtance the ſpecies of ſand ſtone only occurs twice, poſt five times, whilſt the ſhiver occurs no leſs than nine times

To apply the foregoing obſervations to practice.

Suppoſe it was required to examine whether there was coal in a piece of ground adjoining to, or in the neighbourhood of, other coaleries.

11 Methods of ſearching for coal.

Rule 1ſt.

In the firſt place, it is proper to be informed, at ſome of the adjacent coaleries, of the number and kinds of ſtrata, the order in which they lie upon each other; to what point of the horizon, and in what quantity, they dip; if any dikes, hitches, or troubles, and the courſe they ſtretch. Having learnt theſe circumſtances, ſearch in the ground under examination where the ſtrata are expoſed to view, and compare theſe with the other. If they be of the ſame kinds, and nearly correſpond in order and thickneſs, and be lying in a regular manner, and agree by computation with the dip and riſe, it may ſafely be concluded the coal is there; and the depth of it may be judged from the depth of the coal in the other coalery, below any particular ſtratum which is viſible in this.

Rule 2d.

If the ſolid ſtrata are not expoſed to view, neither in the hills nor vallies of the ground under examination, then ſearch in the adjoining grounds, and if the ſame kind of ſtrata are found there as in the adjacent coalery, and there is reaſon, from the dip and other circumſtances, to believe that they ſtretched through the ground to be examined; it may then be concluded that the coal is there, as well as theſe other ſtrata.

Plate CXLIX.

Suppoſe a coalery is on the ſide of a hill at A, fig. 3. and you would ſearch for a coal at B, on the other ſide of the hill, but in a much lower ſituation; by obſerving the ſeveral ſtrata lying above the coal at A, and the point to which they dip, which is directly towards B (if clear of dikes), you may expect to find the ſame kind of ſtrata on the other ſide of the hill, but much lower down. Accordingly, if ſome of the ſtrata are viſible in the face of the precipice C, they may be compared with ſome of thoſe in the pit at A. Or, if they are not to be ſeen there, by ſearching in the oppoſite hill, they may perhaps be diſcovered at the place F; where, if they be found in the manner before mentioned, and there be reaſon to believe they extend regularly from the firſt place to this, it is more than probable the coal, as well as theſe ſtrata, will be found in the intermediate ground.

Rule 3d.

If the ground to be examined lie more to the riſe of the coal, as at E, which being ſuppoſed to be on a flat, perhaps the ſolid ſtrata there may be wholly covered by the gravel, clay, &c. of the outward ſurface lying upon them. In this caſe, by meaſuring the horizontal diſtance and the deſcent of ground from A to E, and computing the quantity of aſcent or riſe of the coal in that diſtance; by comparing theſe together, it may be judged at what depth the coal will be found there, allowing that it lie regular. Thus, ſuppoſe the coal at A 80 yards deep, the diſtance from A to E 500 yards, and that the coal riſes one yard in 10 of horizontal diſtance:

Then, from the depth of the pit	80
Deduct the deſcent of ground from A to E, ſuppoſe - -	24

This remainder would be the depth, if the coal was level - - - - -	56
But as the coal riſes 1 in 10 yards, then deduct what it riſes in 500 yards, which is - - - - - - - -	50
And the remainder is the depth of that coal at E.	6 Yards.

Rule 4th. Or ſuppoſe that the place at B is 500 yards the contrary way, or to the full dip of the coal at A; if a view of the ſolid ſtrata cannot be obtained, then by proceeding in the ſame manner as before, the depth of the coal at that place may be computed. Thus,

To the depth of the coal at the pit A	80
Add the deſcent or inclination of the coal in 500 yards, which, as before, is - - - - - - - - - - -	50
This ſum would be the depth, if the ground was level - - - - -	130
But as the ground deſcends towards B, deduct the quantity of that, which ſuppoſe - - - - - - - -	80
Remains the depth of the coal at B -	50 Yards.

If the place to be examined be neither to the full dip nor full riſe, but in ſome proportion towards either, the ſame method may be purſued, computing how much the coal riſes or dips in a certain diſtance in that direction.

If there is known to be a dike in the workings of the pit at A, which elevates or depreſſes the ſtrata towards the place under examination, then the quantity of the elevation or depreſſion muſt be accordingly added to or deducted from the computed depth of the coal at that place. Suppoſe there is an upcaſt dike of 10 fathoms or 20 yards towards B, then deduct 20 from 50, the depth before computed, there will remain 30 yards or 15 fathoms for the depth of the coal at B.

But it often happens that coal is to be ſearched for, in a part of the country, at ſuch a conſiderable diſtance from all other coaleries, that by reaſon of the intervention of hills, vallies, unknown dikes, &c. the connexion or relation of the ſtrata with thoſe of any other coalery cannot be traced by the methods laſt mentioned; in which caſe a more extenſive view muſt be taken of all circumſtances than was neceſſary in the former; and a few general rules founded on the foregoing obſervations, and on concluſions drawn from them, will greatly aſſiſt in determining ſometimes with a great degree of probability, and ſometimes with abſolute certainty, whether coal be in any particular diſtrict of country or not.

Rule 5th. The firſt proper ſtep to be taken in ſuch a caſe, is to take a general view of that diſtrict of country intended to be ſearched, in order to judge, from the outward appearance or face of the country, which particular part out of the whole is the moſt likely to contain thoſe kind of ſtrata favourable to the production of coal; and conſequently ſuch particular part being found, is the moſt adviſable to be begun with in the examination.

Though the appearance of the outward ſurface gives no certain or infallible rule to judge of the kinds of ſtrata lying beneath, yet it gives a probable one; 12 Mountainous ſituations. for it is generally found, that a chain of mountains or hills riſing to a great height, and very ſteep on the ſides, are commonly compoſed of ſtrata much harder and of different kinds from thoſe before deſcribed wherein coal is found to lie, and therefore unfavourable to the production of coal; and theſe mountainous ſituations are alſo more ſubject to dikes and troubles than the lower grounds; ſo that if the ſolid ſtrata compoſing them gave even favourable ſymptoms of coal, yet the laſt circumſtance would render the quality bad, and the quantity precarious. And, on the whole, it may be obſerved, that mountainous ſituations are found more favourable to the production of metals than of coal. 13 Hills and vallies. It is likewiſe generally found that thoſe diſtricts abounding with vallies, moderately riſing hills, and interſperſed with plains, ſometimes of conſiderable extent, do more commonly contain coal, and thoſe kinds of ſtrata favourable to its production, than either the mountainous or champaign countries; and a country ſo ſituated as this laſt deſcribed, eſpecially if at ſome conſiderable diſtance from the mountains, ought to be the firſt part appointed for particular examination. 14 Plains. Plains, or level grounds of great extent, generally ſituated by the ſides of rivers, or betwixt ſuch moderate riſing grounds as laſt deſcribed, are alſo very favourable to the production of coal, if the ſolid ſtrata, and other circumſtances in the higher grounds adjoining, be conformable; for it will ſcarcely be found, in ſuch a ſituation, that the ſtrata are favourable in the riſing grounds, on both ſides of the plain, and not ſo in the ſpace betwixt them. Though plains be ſo favourable, in ſuch circumſtances, to the production of coal, yet it is often more difficult to be diſcovered in ſuch a ſituation, than in that before deſcribed; becauſe the clay, ſoil, and other lax matter, brought off the higher grounds by rains and other accidents, have generally covered the ſurfaces of ſuch plains to a conſiderable depth, which prevents the exploration of the ſolid ſtrata there, unleſs they be expoſed to view by digging, quarrying, or ſome ſuch operation.

That part of the diſtrict being fixed upon which abounds with moderate hills and vallies as propereſt to begin the examination at, the firſt ſtep to be taken is to examine all places where the ſolid ſtrata are expoſed to view (which are called the *crops* of the ſtrata), as in precipices, hollows, &c. tracing them as accurately and gradually as the circumſtances will allow, from the uppermoſt ſtratum or higheſt part of the ground to the very undermoſt: and if they appear to be of the kinds before deſcribed, it will be proper to note in a memorandum book their different thickneſſes; the order in which they lie upon each other; the point of the horizon to which they dip or incline, the quantity of that inclination, and whether they lie in a regular ſtate. This ſhould be done in every part of the ground where they can be ſeen, obſerving at the ſame time, that if a ſtratum can be found in one place, which has a connection with ſome other in a ſecond place, and if this other has a connection with another in a third place, &c.; then, from theſe ſeparate connections, the joint correſpondence of the whole may be traced, and the ſtrata, which in ſome places are covered, may be known by their correſpondence with thoſe which are expoſed to view.

If by this means the crops of all the ſtrata cannot be ſeen (which is often the caſe), and if no coal be diſcovered by its crop appearing at the ſurface: yet if the ſtrata that have been viewed conſiſt of thoſe kinds before deſcribed, and are found lying in a regular order, it is ſufficiently probable that coal may be in that part of the diſtrict, although it be concealed from ſight by the ſurface of earth or other matter. Rule 6th. Therefore, at the ſame time that the crops of the ſtrata are under examination, it will be proper to take notice of all ſuch ſprings of water as ſeem to be of a mineral nature, particularly thoſe known by the name of iron water, which bear a mud or ſediment of the colour of ruſt or iron, having a ſtrong aſtringent taſte. Springs of this kind proceed originally from thoſe ſtrata which contain beds or balls of iron-ore; but by reaſon of the tenacity of the matter of thoſe ſtrata, the water only diſengages itſelf ſlowly from them, deſcending into ſome more porus or open ſtratum below, where, gathering in a body, it runs out to the ſurface in ſmall ſtreams or rills. The ſtratum of coal is the moſt general reſervoir of this water; for the iron-ſtone being lodged in different kinds of ſhiver, and the coal commonly connected with ſome of them, it therefore deſcends into the coal, where it finds a ready paſſage through the open backs and cutters. Sometimes, indeed, it finds ſome other ſtratum than coal to collect and tranſmit it to the ſurface; but the difference is eaſily diſtinguiſhable; for the ochrey matter in the water, when it comes from a ſtratum of coal, is of a darker ruſty colour than when it proceeds from any other, and often brings with it particles and ſmall pieces of coal; therefore, wherever theſe two circumſtances concur in a number of theſe kind of ſprings, ſituated in a direction from each other anſwerable to the ſtretch or to the inclination of the ſtrata, it may be certain the water comes off coal, and that the coal lies in a ſomewhat higher ſituation than the apertures of the ſprings.

There are other ſprings alſo which come off coal, and are not diſtinguiſhable from common water, otherwiſe than by their aſtringency, and their having a blue ſcum of an oily or glutinous nature ſwimming upon the ſurface of the water. Theſe, in common with the others, bring out particles of coal, more eſpecially in rainy ſeaſons when the ſprings flow with rapidity. When a number of theſe kinds are ſituated from each other in the direction of the ſtrata, as above deſcribed; or if the water does not run forth as in ſprings, but only forms a ſwamp, or an extenſion of ſtagnant water beneath the turf; in either caſe, it may be depended upon that this water proceeds from a ſtratum of coal.

Rule 7th. If the ſtratum of coal is not expoſed to view, or cannot be diſcovered by the firſt method of ſearching for the crop, although the appearance of the other ſtrata be very favourable, and afford a ſtrong probability of coal being there; and if the laſt-mentioned method of judging of the particular place where the crop of the coal may lie, by the ſprings of water iſſuing from it, ſhould, from the deficiency of thoſe ſprings or other circumſtances, be thought equivocal, and not give a ſatisfactory indication of the coal; then a further ſearch may be made in all places where the outward ſurface, or the ſtratum of clay or earth, is turned up by ploughing, ditching, or digging, particularly in the lower grounds, in hollows, and by the ſides of ſtreams. Theſe places ſhould be ſtrictly examined, to ſee if any pieces of coal be intermixed with the ſubſtance of the ſuperior lax ſtrata; if any ſuch be found, and if they be pretty numerous and in detached pieces, of a firm ſubſtance, the angles perfect or not much worn, and the texture of the coal diſtinguiſhable, it may be concluded, that the ſtratum of coal to which they originally did belong, is at no great diſtance, but in a ſituation higher with reſpect to the horizon; and if there be alſo found along with the pieces of coal other mineral matter, ſuch as pieces of ſhiver or freeſtone, this is a concurrent proof that it has come only from a ſmall diſtance. Though the two fore-mentioned methods ſhould only have produced a ſtrong probability, yet if this laſt-mentioned place, where the pieces of coals, &c. are found in the clay, be in a ſituation lower than the ſprings; when this circumſtance is joined to the other two, it amounts to little leſs than a moral certainty of the ſtratum of coal being a very little above the level of the ſprings. But if, on the contrary, theſe pieces of coal are found more ſparingly interſperſed in the ſuperior ſtratum, and if the angles are much fretted or worn off, and very little of other kinds of mineral matter connected with them; it may then be concluded, that they have come from a ſtratum of coal ſituated at a greater diſtance than in the former caſe; and by a ſtrict ſearch and an accurate compariſon of other circumſtances, that particular place may be diſcovered with as much certainty as the other.

After the place is thus diſcovered, where the ſtratum of coal is expected to lie concealed, the next proper ſtep to be taken, is to begin digging a pit or hole there perpendicularly down to find the coal. If the coal has no ſolid ſtrata above and beneath it, but be found only embodied in the clay or other lax matter, it will not be there of its full thickneſs, nor ſo hard and pure as in its perfect ſtate when encloſed betwixt two ſolid ſtrata, the uppermoſt called the *roof*, and the undermoſt called the *pavement*, of the coal: in ſuch ſituation therefore it becomes neceſſary, either to dig a new pit, or to work a mine forward until the ſtratum of coal be found included betwixt a ſolid roof and pavement, after which it need not be expected to increaſe much in its thickneſs: yet as it goes deeper or farther to the dip, it moſt likely will improve in its quality; for that part of the ſtratum of coal which lies near the ſurface, or only at a ſmall depth, is often debaſed by a mixture of earth and ſundry other impurities, waſhed down from the ſurface, through the backs and cutters, by the rains; whilſt the other part of the ſtratum which lies at a greater depth is preſerved pure, by the other ſolid ſtrata above it intercepting all the mud waſhed from the ſurface.

The above methods of inveſtigation admit of many different caſes, according to the greater or leſs number of favourable circumſtances attending each of the modes of inquiry; and the reſult accordingly admits every degree of probability, from the moſt diſtant, even up to abſolute certainty. In ſome ſituations, the coal will be diſcovered by one method alone, in others, by a compariſon of certain circumſtances attending each method; whilſt in ſome others, all the circumſtances that can be collected only lead to a certain degree of probability.

In the laſt caſe, where the evidence is only probable, it will be more adviſable to proceed in the ſearch by boring a hole through the ſolid ſtrata (in the manner hereafter deſcribed), than by digging or ſinking a pit, it being both cheaper and more expeditious; and in every caſe, which does not amount to an abſolute certainty, this operation is neceſſary, to aſcertain the real exiſtence of the coal in that place.

We ſhall now ſuppoſe that, having examined a certain diſtrict, ſituated within a few miles of the ſea or ſome navigable river, that all the circumſtances which offer only amount to a probability of the coal being there, and that boring is neceſſary to aſcertain it. We ſhall therefore deſcribe the operation of boring to the coal; then the method of clearing it from water, commonly called *winning* it; and all the ſubſequent operations of working the coal and raiſing it to the ſurface, leading it to the river or harbour, and finally putting it on board the ſhips.

15
Of boring for the coal.

Plate CXLIX.

Suppoſe that the ground, A, B, C, D, fig. 4. has been examined, and from the appearance of the ſtrata where they are viſible (as at the precipice D, and ſeveral other places), they are found to be of thoſe kinds uſually connected with coal, and that the point to which they riſe is directly weſt towards A, but the ground being flat and covered to a conſiderable depth with earth, &c. the ſtrata cannot be viewed in the low grounds; therefore, in this and all ſimilar ſituations, the firſt hole that is bored for a trial for coal ſhould be on the weſt ſide of the ground, or to the full riſe of the ſtrata as at A, where, boring down through the ſtrata 1, 2, 3, ſuppoſe 10 fathoms, and not finding coal, it will be better to bore a new hole than to proceed to a great depth in that; therefore, proceeding ſo far to the eaſtward as B, where the ſtratum 1, of the firſt hole, is computed to be 10 or 12 fathoms deep, a ſecond hole may be bored, where boring down through the ſtrata 4, 5, 6, 7, 8, the ſtratum 1 is met with, but no coal; it would be of no uſe to bore farther in this hole, as the ſame ſtrata would be found which were in the hole A: therefore, proceeding again ſo far to the eaſtward, as it may be computed the ſtratum 4 of the ſecond hole will be met with at the depth of 10 or 12 fathoms, a new hole may be bored C, where, boring through the ſtrata 9, 10, 11, 12, the coal is met with at 13, before the hole proceed ſo deep as the ſtratum 4 of the former. It is evident, that, by this method of procedure, neither the coal nor any other of the ſtrata can be paſſed over, as the laſt hole is always bored down to that ſtratum which was neareſt the ſurface in the former hole.

The purpoſes for which boring is uſed are numerous, and ſome of them of the utmoſt importance in coaleries. In coaleries of great extent, although the coal be known to extend through the whole grounds, yet accidental turns, and other alterations in the dip, to which the coal is liable, render the boring of three or more holes neceſſary, to determine exactly to what point of the horizon it dips or inclines, before any capital operation for the winning of it can be undertaken; becauſe a very ſmall error in this may occaſion the loſs of a great part of the coal, or at leaſt incur a double expence in recovering it.

Suppoſe A, B, C, D, fig. 5 to be part of an extenſive field of coal, intended to be won or laid dry by a fire-engine; according to the courſe of the dip in adjoining coaleries, the point C is the place at which the engine ſhould be erected, becauſe the coal dips in direction of the line AC, conſequently the level line would be in the direction CD; but this ought not to be truſted to. Admit two holes, 1, 2, be bored to the coal in the direction of the ſuppoſed dip, at 200 yards diſtance from each other, and a third hole 3 at 200 yards diſtance from each of them: ſuppoſe the coal is found, at the hole 1, to be 20 fathoms deep; at the hole 2, 10 fathoms deeper; but at the hole 3, only 8 fathoms deeper than at 1. Then to find the true level line and dip of the coal, ſay, As 10 fathoms, the dip from 1 to 2, are to 200 yards the diſtance, ſo are 8 fathoms, the dip from 1 to 3, to 160 yards, the diſtance from one on the line 1, 2, to *a*, the point upon a level with the hole 3. Again ſay, As 8 fathoms, the dip from 1 to 3, are to 200 yards the diſtance; ſo are 10 fathoms, the dip from 1 to 2, to 250 yards, the diſtance from 1, in direction of the line 1, 3, to *b*, the point upon a level with the hole 2. Then let fall the perpendicular 1, *e*, which will be the true direction of the dip of the coal, inſtead of the ſuppoſed line AC; and by drawing ED, and DF, parallel to the other lines, the angle D, and no other place is the deepeſt part of the coal, and the place where the engine ſhould be erected. If it had been erected at the angle C, the level line would have gone in the direction *c b*, by which means about one-third part of the field of coal would have been below the level of the engine, and perhaps loſt, without another engine was erected at D.

Boring not only ſhows the depth at which the coal lies, but its exact thickneſs; its hardneſs; its quality, whether cloſe burning or open burning, and whether any foul mixture is in it or not; alſo the thickneſs, hardneſs and other circumſtances of all the ſtrata bored through; and from the quantity of water met with in the boring, ſome judgment may be formed of the ſize of an engine capable of drawing it, where an engine is neceſſary. When holes are to be bored for theſe purpoſes, they may be fixed (as near as can be gueſſed) in ſuch a ſituation from each other, as to ſuit the places where pits are afterwards to be ſunk: by which means moſt of the expence may be ſaved, as theſe pits would otherwiſe require to be bored, when ſinking, to diſcharge their water into the mire below. There are many other uſes to which boring is applied, as will be explained hereafter.

For theſe reaſons, boring is greatly practiſed in England, and is brought to great perfection; and as the operation is generally entruſted to a man of integrity, who makes it his profeſſion, the accounts given by him of the thickneſs and other circumſtances of the ſtrata, are the moſt accurate imaginable, and are truſted to with the greateſt confidence; for as very few gentlemen chooſe to take a leaſe of a new coalery which has not been ſufficiently explored by boring, it is neceſſary the accounts ſhould be faithful, being the only rule to guide the landlord in letting his coal, and the tenant in taking it. In Scotland it is not ſo generally practiſed; nor are there any men of character who are profeſſed borers, that operation being commonly left to any common workman; whence it happens, that it never has been in any eſteem, the accounts given by them being ſo imperfect and equivocal, as not to merit any confidence.

The tools or inſtruments uſed in boring are very ſimple. The boring rods are made of iron from 3 to 4 feet long, and about one inch and a half ſquare, with a ſcrew at each end, by which they are ſcrewed together, and other rods added, as the hole increaſes in depth. The chiſel is about 18 inches long, and two and a half broad at the end, which being ſcrewed on at the lower end of the rods, and a piece of timber put through an eye at the upper end, they are prepared for work. The operation is performed by lifting them up a little, and letting them fall again, at the ſame time turning them a little round; by a continuance of which motions, a round hole is fretted or worn through the hardeſt ſtrata. When the chiſel is blunt, it is taken out, and a ſcooped inſtrument called a *wimble* put on in its ſtead; by which the duſt or pulverized matter which was worn off the ſtratum in the laſt operation is brought up. By this ſubſtance, the borers know exactly the nature of the ſtratum they are boring in: and by any alteration in the working of the rods (which they are ſenſible of by handling them), they perceive the leaſt variation of the ſtrata. The principal part of the art depends upon keeping the hole clean, and obſerving every variation of the ſtrata with care and attention.

The eſtabliſhed price of boring in England was ſome time ago 5s. per fathom for the firſt five fathoms, 10s. per fathom for the next five fathoms, and 15s. per fathom for the next five fathoms; and ſo continually increaſing 5s. per fathom at the end of every five fathoms; the borer finding all kinds of boring inſtruments, and taking his chance of the hardneſs of the ſtrata, except above one foot in thickneſs of whin occur, when the former price ceaſes, and he is paid per day.

16
Of winning the coal.

It is exceedingly uncommon to meet with a ſtratum of coal which is naturally dry, or whoſe ſubterranean ſprings or feeders of water are ſo very ſmall as to require no other means than the labour of men to draw off or conduct them away; for it moſt commonly happens that the ſtratum of coal, and the other ſtrata adjacent, abound ſo much in feeders of water, that, before acceſs can be had to the coal, ſome other methods muſt be purſued to drain or conduct away theſe feeders; therefore, after the deepeſt part of the coal is diſcovered, the next conſideration is of the beſt method of draining it, or, in the miners language, *of winning the coal*.

If the coal lies in ſuch an elevated ſituation, that a part of it can be drained by a level brought up from the lower grounds, then that will be the moſt *natural* method; but whether it be the moſt *proper* or not, depends upon certain circumſtances. If the ſituation of the ground be ſuch, that the level would be of a great length, or have to come through very hard ſtrata, and the quantity of coal it would drain, or the profits expected to be produced by that coal, ſhould be inadequate to the expence of carrying it up; in ſuch caſe ſome other method of winning might be more proper. Or ſuppoſe, in another caſe, it be found, that a level can be had to a coalery, which will coſt 2000l. and require five years to bring it up to the coal, and that it will drain 30 acres of coal when completed; yet if it be found that a fire engine, or ſome other machine, can be erected on that coalery, for the ſame ſum of money, in one year, which will drain 50 acres of the ſame coal, then this laſt would be a more proper method than the level; becauſe four years profit would be received by this method before any could come in by the other; and after the 30 acres drained by the level is all wrought, a machine of ſome kind would neverthleſs be neceſſary to drain the remaining 20 acres; ſo that erecting a machine at firſt would be on all accounts the moſt adviſible.

Where a level can be driven, in a reaſonable time, and at an adequate expence, to drain a ſufficient tract of coal, it is then the moſt eligible method of winning; becauſe the charge of upholding it is generally leſs than that of upholding fire-engines or other machines.

If a level is judged propereſt after conſideration of every neceſſary circumſtance, it may be begun at the place appointed in the manner of an open ditch, about three feet wide, and carried forward until it be about ſix or ſeven feet deep from the ſurface, taking care to ſecure the bottom and ſides by timber-work or building, after which it may be continued in the manner of a mine about three feet wide, and three feet and a half high, through the ſolid ſtrata, taking care all along to keep the bottom upon a level, and to ſecure the roof, ſides, and bottom, by timber or building, in all places where the ſtrata are not ſtrong enough to ſupport the incumbent weight, or where they are liable to decay by their expoſure to the freſh air. If the mine has to go a very long way before it reaches the coal, it may be neceſſary to ſink a ſmall pit, for the convenience of taking out the ſtones and rubbiſh produced in working the mine, as well as to ſupply freſh air to the workmen; and if the air ſhould afterwards turn damp, then ſquare wooden pipes made of deals cloſely jointed (commonly called *air-boxes*), may be fixed in the upper part of the mine, from the pit-bottom all the way to the end of the mine, which will cauſe a ſufficient circulation of freſh air for the workmen. Perhaps in a great length it will be found proper to ſink another or more pits upon the mine, and by proceeding in this manner it may be carried forward until it arrive at the coal; and after driving a mine in the coal a few yards to one ſide, the firſt coal-pit may be ſunk

If a level is found impracticable, or for particular reaſons unadviſable, then a fire-engine*, or ſome other machine will be neceſſary, which ſhould be fixed upon the deepeſt part of the coal, or at leaſt ſo far towards the dip as will drain a ſufficient extent of coal, to continue for the time intended to work the coalery; and whether a fire-engine, or any other machine is uſed, it will be of great advantage to have a partial level brought up to the engine-pit, if the ſituation of the ground will admit it at a ſmall charge, in order to receive and convey away the water without drawing it ſo high as to the ſurface; for if the pit was 30 fathoms deep to the coal, and if there was a partial level which received the water five fathoms only

* See article *Steam-Engine*.

only below the ſurface, the engine by this means would be enabled to draw one-6th part more water than without it; and if there were any feeders of water in the pit above this level, they might be conveyed into it, where they would be diſcharged without being drawn by the engine.

The engine-pit may be from ſeven to nine feet wide, and whether it be circular, oval, or of any other form, is not very material, provided it be ſufficiently ſtrong, though a circular form is moſt generally approved. If any feeders of water are met with a few fathoms from the ſurface, it will be proper to make a circular or ſpiral cutting about one foot deep, and a little hollowed in the bottom, round the circumference of the pit, in order to receive and conduct the water down, without flying over the pit and incommoding the workmen. If the ſtrata are of ſo tender or friable a nature as not to bear this operation, or if the water leaks through them, then it will be neceſſary to inſert in the fore-mentioned cutting a circular piece of timber called a *crib*, hollowed in the ſame manner to collect the water; and a ſecond may be inſerted two or three yards below the firſt, with a ſloping niche down the wall or ſide of the pit, to convey the water from the former into it; proceeding by ſome of theſe methods until the pit is ſunk 15 or 20 fathoms, at which place it would be proper to fix a ciſtern or reſervoir, for the firſt or upper ſet of pumps to ſtand in; for if the pit be 30 fathoms as ſuppoſed, it would be too great a length for the pumps to be all in one ſet from bottom to top; therefore, if any extraordinary feeders are met with, betwixt 15 and 20 fathoms deep, it would be beſt to fix the ciſtern where it may receive them, and prevent their deſcending to the bottom; obſerving that the upper ſet of pumps be ſo much larger than the lower one, as the additional feeders may require; or if there are no additional feeders, it ought then to be a little ſmaller.

After the upper ciſtern is fixed, the operation may be purſued by the other ſet of pumps in much the ſame manner as has been deſcribed, until the pit is ſunk to the coal; which being done, it would be proper to ſink it ſix or eight feet deeper, and to work ſome coal out from the dip ſide of the pit, to make room for a large quantity of water to collect, without incommoding the coal-pits when the engine is not working.

It would exceed the proper bounds of this article to enumerate all the accidents to which engine-pits are liable in ſinking; we ſhall therefore only recite a few which ſeem important.

If a quickſand happens to lie above the ſolid ſtrata, next the ſurface, it may be got through by digging the pit of ſuch a wideneſs at the top (allowing for the natural ſlope or running of the ſand) as to have the proper ſize of the pit on the uppermoſt ſolid ſtratum, where fixing a wooden frame or tub as the timber-work of the pit, and covering it round on the outſide with wrought clay up to the top, the ſand may again be thrown into the excavation round the tub, and levelled with the ſurface.

If the quickſand ſhould happen to lie at a conſiderable depth betwixt the clay and ſolid ſtrata, then a ſtrong tub of timber cloſely jointed and ſhod with iron, of ſuch a diameter as the pit will admit, may be let down into it; and by fixing a great weight upon the top, and by working out the ſand, it may be made to ſink gradually, until it comes to the rock or other ſolid ſtratum below; and when all the ſand is got out, if it be lightly calked and ſecured, it will be ſufficient.

It ſometimes happens, that a ſtratum of ſoft matter lying betwixt two hard ſolid ones, produces ſo large a quantity of water as greatly to incommode the operations. In ſuch a caſe, a frame-work of plank, ſtrengthened with cribs and cloſely calked, will keep back the whole or the greateſt part of it, provided the two ſtrata which include it are of a cloſe texture; or let an excavation of about two feet be made in the ſoft ſtratum quite round the circumference of the pit, and let that be filled cloſe up betwixt the hard ſtrata with pieces of dry fir-timber about ten inches ſquare inſerted endwiſe, and afterwards as many wooden wedges driven into them as they can be made to receive; if this be well finiſhed, little or no water will find a paſſage through it.

It rarely happens that any ſuffocating damp or foul air is met with in an engine-pit; the falling of water, and the working of the pumps, generally cauſing a ſufficient circulation of freſh air. But that kind of combuſtible vapour, or inflammable air, which will catch fire at a candle, is often met with. It proceeds from the partings, backs, and cutters, of the ſolid ſtrata, exhaling from ſome in an inſenſible manner, whilſt from others it blows with as great impetuoſity as a pair of bellows. When this inflammable air is permitted to accumulate, it becomes dangerous by taking fire, and burning or deſtroying the workmen, and ſometimes by its exploſion will blow the timber out of the pit, and do conſiderable damage. If a conſiderable ſupply of freſh air is forced down the pit by air-boxes and a ventilator, or by dividing the pit into two by a cloſe partition of deals from top to bottom, or by any other means, it will be driven out, or ſo weakened that it will be of no dangerous conſequence; or when the inflammable air is very ſtrong, it may be ſafely carried off by making a cloſe ſheathing or lining of thin deals quite round the circumference of the pit, from the top of the ſolid ſtrata to the bottom, and lengthening it as the pit is ſunk, leaving a ſmall vacancy behind the ſheathing; when the combuſtible matter which exhales from the ſtrata, being confined behind theſe deals, may be vented by one or two ſmall leaden pipes carried from the ſheathing to the ſurface, ſo that very little of it can tranſpire into the area of the pit. If a candle be applied to the orifice of the pipe at the ſurface, the inflammable air will inſtantly take fire, and continue burning like an oil-lamp, until it be extinguiſhed by ſome external cauſe. Upon the whole, every method ſhould be uſed to make the pit as ſtrong in every part, and to keep it as dry as poſſible; and whenever any accident happens, it ſhould be as expeditiouſly and thoroughly repaired as poſſible, before any other operation be proceeded in, leſt an additional one follow, which would more than double the difficulty of repairing it.

17
Of working the coal.

The firſt operations, after ſinking the engine-pit, are the working or driving a mine in the coal, and ſinking the firſt coal-pit. The ſituation of the firſt coal-pit ſhould be a little to the riſe of the engine-pit, that the water which collects there may not obſtruct the working

working of the coals every time the engine ſtops; and it ſhould not exceed the diſtance of 20, 30, or 40 yards, becauſe when the firſt mine has to be driven a long way, it becomes both difficult and expenſive. If there be not a ſufficient circulation of freſh air in the mine, it may be ſupplied by the before deſcribed air-boxes and a ventilator, until it arrives below the intended coal-pit, when the pit may be bored and ſunk to the coal, in the manner before mentioned.

After the pit is thus got down to the coal, the next conſideration ſhould be, the beſt method of working it. The moſt general practice in Scotland is to excavate and take away a part only of the ſtratum of coal in the firſt working of the pit, leaving the other part as pillars for ſupporting the roof; and after the coal is wrought in this manner to ſuch a diſtance from the pit as intended, then theſe pillars, or ſo many of them as can be got, are taken out by a ſecond working, and the roof and other ſolid ſtrata above permitted to fall down and fill up the excavation. The quantity of coal wrought away, and the ſize of the pillars left in the firſt working, is proportioned to the hardneſs and ſtrength of the coal and other ſtrata adjacent, compared with the incumbent weight of the ſuperior ſtrata.

The ſame mode of working is purſued in moſt parts of England, differing only as the circumſtances of the coalery may require; for the Engliſh coal, particularly in the northern counties, being of a fine tender texture, and of the cloſe-burning kind, and alſo the roof and pavement of the coal in general not ſo ſtrong as in Scotland, they are obliged to leave a larger proportion of coal in the pillars for ſupporting the roof, during the firſt time of working; and, in the ſecond working, as many of theſe pillars are wrought away as can be got with ſafety.

The Scots coal in general being very hard, and of the open-burning kind, it is neceſſary to work it in ſuch a manner as to produce as many *great coals* as poſſible, which is beſt effected by taking away as high a proportion of the coal as circumſtances will allow in the firſt working; on the contrary, the Engliſh coal being very tender, cannot poſſibly be wrought large, nor is it of much importance how ſmall they are, being of ſo rich a quality; ſo that a larger proportion may be left in pillars in this coal than could with propriety be done in the other; and, when all circumſtances are conſidered, each method ſeems well adapted to the different purpoſes intended.

The ancient method of working was, to work away as much of the coal as could be got with ſafety at one working only, by which means the pillars were left ſo ſmall as to be cruſhed by the weight of the ſuperior ſtrata, and entirely loſt. As great quantities of coals were loſt by this method, it is now generally exploded, and the former adopted in its place, by which a much larger quantity of coal is obtained from the ſame extent of ground, and at a much leſs expence in the end.

The exact proportion of coal proper to be wrought away, and to be left in pillars at the firſt working, may be judged of by a compariſon of the circumſtances before mentioned. If the roof and pavement are both ſtrong, as well as the coal, and the pit about 30 fathoms deep, then two-thirds, or probably three-fourths, may be taken away at the firſt working, and one-third or one-fourth left in pillars. If both roof and pavement be ſoft or tender, then a larger proportion muſt be left in pillars, probably one-third or near one-half; and in all caſes the hardneſs or ſtrength of the coal muſt be conſidered. If tender, it will require a larger pillar than hard coal; becauſe, by being expoſed to the air after the firſt working, a part of it will moulder and fall off, by which it will loſe much of its ſolidity and reſiſtance.

The proportion to be wrought away and left in pillars being determined, the next proper ſtep is to fix upon ſuch dimenſions of the pillars to be left, and of the excavations from which the coal is to be taken away, as may produce that proportion. In order to form a juſt idea of which, ſee a plan of part of a pit's workings (fig. 6.) ſuppoſed to be at the depth of 30 fathoms, and the coal having a moderate riſe. A, repreſents the engine-pit; B, the coal pit; A *a* B, the mine from the former to the latter; BC, the firſt working or excavation made from the coal-pit, commonly called the *winning mine* or *winning headway*, nine feet wide; *bbbb*, &c. the workings called *rooms*, turned off at right angles from the others, of the width of 12 feet: *cccc*, &c. the workings called *throughers* or *thirlings*, 9 feet wide, wrought through at right angles from one room to another; *ddd*, &c. the pillars of coal left at the firſt working for ſupporting the roof, 18 feet long and 12 feet broad; DD, two large pillars of coal near the pit bottom, 15 or 20 yards long, and 10 or 15 broad, to ſupport the pit, and prevent its being damaged by the roof falling in; *ee*, the level mine wrought in the coal from the engine-pit bottom four or five feet wide; *ff*, &c, large pillars of coal left next the level, to ſecure it from any damage by the roof falling in; *gg*, a dike which depreſſes the coal, 1 fathom; *hh*, &c. large pillars and barriers of coal, left unwrought, adjoining to the dike where the roof is tender, to prevent its falling down. The coal taken out by the firſt working in this pit is ſuppoſed to be one-third of the whole; and allowing the rooms 12 feet wide, and the thirlings 9 feet wide, then the pillars will require to be 12 feet wide and 18 feet long; for if one pillar be in a certain proportion to its adjoining room and thirling, the whole number of pillars will be in the ſame proportion to the whole number of rooms and thirlings in the pit. Suppoſe ABCD (fig. 7.) to be a pillar of coal 18 feet long and 12 feet broad, its area will be 216 ſquare feet; ACHE, the adjoining thirling, 12 feet by 9 feet, and its area 108 ſquare feet; BAEFG, the adjoining room, 27 feet long and 12 feet broad, and its area 324 ſquare feet; which added to 108 gives 432 ſquare feet, or two-thirds wrought, and 216 ſquare feet left, or one-third of the whole area FGHD.

Plate CXLIX.

It is proper to obſerve, that in the proſecution of the workings, the rooms to the right of the winning headway ſhould be oppoſite to the pillars on the left, and the firſt, third, and fifth pillar, or the ſecond, fourth, and ſixth, adjoining to the ſaid headway, ſhould be of ſuch a length as to overlay the adjoining thirlings, as, in the plan, the pillar 2 overlays the thirlings 1 and 3; and the pillar 4 overlays the thirlings 3 and 5; this will effectually ſupport the roof of the main road BC, and will bring the other pillars into their regular order, by which means each pillar will be oppoſite to two thirlings. Alſo a larger proportion of coal than common ſhould be left in all places which are intended to be kept open after the ſecond working, ſuch as the pit-bottoms, air-courſes, roads, and water-courſes, or where the roof is tender, as it generally is near dikes, hitches, and troubles; and if the roof ſhould continue tender for a conſiderable ſpace, it will perhaps be found proper to leave a few inches of coal adhering to the roof, which, together with a few props of timber fixed under it, may ſupport it effectually for a long time. The level mine *ee*, and the winning headway BC, ſhould be wrought forward a conſiderable length before the other rooms, in order to be driven through any dikes that might interpoſe, otherwiſe the progreſs of the workings might probably be ſtopped a conſiderable time, waiting until a courſe of new rooms were procured on the other ſide of the dike. Suppoſe the dike *gg*, fig. 6. to depreſs the coal ſix feet or one fathom, and that it riſes in the ſame manner on the under ſide of the dike as it does on the upper ſide; in ſuch a caſe, the only remedy would be to work or drive a level mine through the ſtrata of ſtone from the engine-level at *e*, over the dike, until it interſect the coal at *i*; and from thence to drive a new level mine in the coal at *ii*, and a new winning headway *ik*. In order to gain a new ſet of rooms and to ſupply freſh air to this new operation, a ſmall mine might be driven from the room *h*, and a hole ſunk down upon the level room *ii*; therefore, if the level mine *ee* was not driven ſo far forward as to have all theſe operations completed before the rooms and other workings were intercepted by the dike, the working of the pit might ceaſe until theſe new places were ready.

If there be two or three ſtrata or ſeams of coal in the ſame pit (as there often are) having only a ſtratum of a few feet thick lying betwixt them, it is then material to obſerve, that every pillar in the ſecond ſeam be placed immediately before one in the firſt, and every pillar in the third ſeam below one in the ſecond; and in ſuch a ſituation the upper ſtratum of coal ought to be firſt wrought, or elſe all the three together; for it would be unſafe to work the lower one firſt, leſt the roof ſhould break, and damage thoſe lying above.

It ſometimes becomes neceſſary to work the coal lying to the dip of the engine or the level; which coal is conſequently drowned with water, and muſt therefore be drained by ſome means before it can be wrought. If the quantity of water proceeding from it be inconſiderable, it may then be drained by ſmall pumps laid upon the pavement of the coal, and wrought by men or horſes, to raiſe the water up to the level of the engine-pit bottom; or if the feeders of water be more conſiderable, and the ſituation be ſuitable, the working rod of theſe pumps might be connected with thoſe in the engine-pit; by which means the water would be raiſed up to the level; but if the quantity of water be very great; or if, from other circumſtances, theſe methods may not be applicable; then the engine-pit may be ſunk as deep below the coal as may be neceſſary, and a level ſtone mine driven from its bottom to the dip of the ſtrata, until it interſect the ſtratum of coal, from whence a new level mine might be wrought, which would effectually drain it. Suppoſe AB, fig. 8. to be a ſection of the engine-pit; BC, the coal drained by the engine; BD, the coal to the dip of the engine intended to be drained; then if the engine-pit be ſunk deeper to E, a ſtone mine may be wrought in the direction ED, until it interſect the coal at D, by which the water will have a free paſſage to the engine, and the coal will be drained.

If there be another ſtratum of coal lying at ſuch a depth below the firſt as the engine-pit is intended to be ſunk to, the upper ſeam may in ſome ſituations be conveniently drained, by driving a mine in the lower ſeam of coal from E to F, and another in the upper one from B to D; and by boring a hole from D to F, the water will deſcend to F, and, filling the mine EF, riſe up to the engine-pit bottom at E, which is upon a level with D.

Whenever it is judged neceſſary to work the pillars, regard muſt be had to the nature of the roof. If the roof is tender, a narrow room may be wrought through the pillar from one end to the other, leaving only a ſhell of coal on each ſide for ſupporting the roof the time of working. Suppoſe ABCD, fig. 7. to be a pillar of coal 18 feet long and 12 feet broad: if the roof is not ſtrong, the room 1, 2, 3, 4, of eight feet wide, may be wrought up through that pillar, leaving a ſhell of two feet thick on each ſide; and if it can be ſafely done, a part of theſe ſhells may alſo be wrought away, by working two places through them as at 5 and 6. By this means very little of the coal will be loſt; for two-thirds of the whole being obtained by the firſt working, and above two-thirds of the pillar by the ſecond working, the loſs upon the whole would not exceed one-tenth: but it may be obſerved, that ſome pillars will not produce ſo great a proportion, and perhaps others cannot be wrought at all; ſo that, upon the whole, there may be about one-ſixth, one-ſeventh, or in ſome ſituations but one-eigth part of the coal loſt. If the roof be hard and ſtrong, then as much coal may be wrought off each ſide and each end of the pillar as can be done with ſafety, leaving only a ſmall piece ſtanding in the middle; and when the roof is very ſtrong, ſometimes ſeveral pillars may be taken entirely out, without any loſs of coal: and in general this laſt method is attended with leſs loſs, and produces larger coals, than the former. In all caſes it is proper to begin working thoſe pillars firſt which lie fartheſt from the pit bottom, and to proceed working them regularly away towards the pit; but if there be a great number of pillars to the dip of the pit, it is the ſafeſt method to work theſe out before thoſe to the riſe of the pit are begun with.

There is no great difference in the weight of different kinds of coals, the lighteſt being about 74 pounds avoirdupois, and the heavieſt about 79 pounds the cubic foot; but the moſt uſual weight is 75 pounds the foot, which is 18 hundred weight and 9 pounds the cubic yard. The ſtatute chalder is 53 hundred weight; or when meaſured is as follows: 268.8 cubic inches to the Wincheſter gallon; 4½ gallons to the coal peck, about 3 pounds weight; 8 coal-pecks to the boll, about 247⅓ pounds; and 24 bolls to the chalder, of 53 hundred weight. If one coal meaſuring exactly a cubic yard (nearly equal to 5 bolls) be broken into pieces of a moderate ſize, it will meaſure ſeven coal bolls and a half. If broken very ſmall, it will meaſure 9 bolls; which ſhews, that the proportion of the weight to the meaſure depends upon the ſize of the coals; therefore accounting by weight is the moſt rational method.

A Table of the weight and quantity of coal contained in one acre Scots meaſure, allowing one-ſixth part to be loſt below ground, in ſeams of the following thickneſſes.

Thickneſs of Coal.		Weight in Tons.	Quantity in Chalders.
Feet.	Inches.		
2	0	3068	1158—
2	6	3835	1447+
3	0	4602	1736+
3	6	5369	2026+
4	0	6136	2315+
4	6	6903	2604+
5	0	7670	2894+
5	6	8437	3183+
6	0	9204	3473+

We ſhall next mention ſome of the various methods of bringing the coals from the rooms and other workings to the pit-bottom. Where the ſtratum of coal is of a ſufficient thickneſs, and has a moderate riſe and dip, the coals are moſt advantageouſly brought out by horſes, who draw out the coals in a tub or baſket placed upon a ſledge: a horſe by this means will bring out from four to eight hundred weight of coals at once, according to the quantity of the aſcent or deſcent. In ſome coaleries they have acceſs to the workings by a mine made for them, ſloping down from the ſurface of the earth to the coal; and where that convenience is wanting, they are bound into a net, and lowered down the pit. If the coal be not of ſuch a height as to admit horſes, and has a moderate riſe like the laſt, then men are employed to bring out the coals: they uſually draw a baſket of four or five hundred weight of coals, fixed upon a ſmall four-wheeled carriage. There are ſome ſituations in which neither horſes nor men can be properly uſed; particularly where the coal has a great degree of deſcent, or where many dikes occur: in ſuch a caſe the coals are beſt brought out by women called *bearers*, who carry them in a kind of baſket upon their backs, uſually a hundred, or a hundred weight and a half, at once.

When the coals are brought to the pit-bottom, the baſkets are then hooked on to a chain, and drawn up the pit by a rope to the ſurface, which is beſt effected by a machine called a *gin*, wrought by horſes. There are other kinds of gins for drawing coals, ſome wrought by water, others by the vibrating lever of a fire-engine, but either of theſe laſt is only convenient in ſome particular ſituations, thoſe wrought by horſes being in moſt general uſe. After the coals are got to the ſurface, they are drawn a ſmall diſtance from the pit, and laid in ſeparate heaps: the larger coals in one heap, the ſmaller pieces called *chews* in another, and the *culm* or *pan-coal* in a ſeparate place.

18
Of cruſhes and ſitts.

There is an accident of a very dangerous nature, to which all coaleries are liable, and which has been the ruin of ſeveral; it is called a *cruſh*, or a *ſitt*. When the pillars of coal are left ſo ſmall as to fail, or yield under the weight of the ſuperior ſtrata; or when the pavement of the coal is ſo ſoft as to permit the pillars to ſink into it, which ſometimes happens by the great weight that lies upon them; in either caſe the ſolid ſtratum above the coal breaks and falls in, cruſhes the pillar to pieces, and cloſes up a great extent of the workings, or probably the whole coalery. As ſuch an accident ſeldom comes on ſuddenly, if it be perceived in the beginning, it may ſometimes be ſtopped by building large pillars of ſtone amongſt the coal pillars: but if it has already made ſome progreſs, then the beſt method is to work away as many of the coal pillars adjoining to the cruſh as may be ſufficient to let the roof fall freely down; and if it makes a breach of the ſolid ſtrata from the coal up to the ſurface, it will very probably prevent the cruſh from proceeding any farther in that part of the coalery. If the cruſh begins in the riſe part of the coalery, it is more difficult to ſtop it from proceeding to the dip, than it is to ſtop it from going to the riſe when it begins in a contrary part.

19
Foul air.

Another circumſtance proper to be taken notice of is the foul or adulterated air ſo often troubleſome in coaleries. Of this there are two kinds; the black damp or ſtyth, which is of a ſuffocating nature; and the inflammable or combuſtible damp. Without ſtaying to inquire, in this place, into the origin and effects of theſe damps, it may be ſufficient to obſerve, that, in whatever part of any coalery a conſtant ſupply or a circulation of freſh air is wanting, there ſome of theſe damps exiſt, accumulate in a body, and become noxious or fatal; and whenever there is a good circulation of freſh air, they cannot accumulate, being mixed with and carried away by the ſtream of air as faſt as they generate or exhale from the ſtrata. Upon theſe principles are founded the ſeveral methods of ventilating a coalery. Suppoſe the workings of the pits A and B (fig. 6.) to be obnoxious to the inflammable damps; if the communication was open betwixt the two pits, the air which went down the pit A would proceed immediately along the mine *a*, and aſcend out of the pit B; for it naturally takes the neareſt direction, ſo that the air in all the workings would be ſtagnant; and they would be utterly inacceſſible from the accumulation of the combuſtible damp. In order to expel this, the air muſt be made to circulate through all the different rooms by means of collateral air-courſes made in this manner: The paſſage or mine *a* muſt be cloſed up or ſtopped by a partition of deals, or by a wall built with bricks or ſtones, to prevent the air paſſing that way. This building is called a *ſtopping*. There muſt alſo be ſtoppings made in the thirlings 1 1 1, &c. betwixt the pillars *f f*, &c. which will direct the air up the mine *e e*, until it arrives at the innermoſt thirling 2, which is to be left open for its paſſage. There muſt alſo be ſtoppings made at the ſide of the mine *a* at *m m*, and on both ſides of the main headway BC at *b b*, &c. then returning to the innermoſt thirling 2, proceed to the third row of pillars, and build up the thirlings 2 2, &c. leaving open the thirling 3 for a paſſage for the air; and proceeding on to the fifth row of pillars, build up in the ſame manner the ſtoppings 3 3, &c. leaving open 4 for an air courſe: and by proceeding in this manner to ſtop up the thirlings or paſſages in every other row of pillars, the cur-

Plate CXLIX.

rent of freſh air will circulate through and ventilate the whole workings, in the direction pointed to by the ſmall arrows in the plan, clearing away all the damps and noxious vapours that may generate. When it is arrived at C, it is conducted acroſs the main headway, and carried through the other part of the pit's workings in the ſame manner, until it returns through *n n* to the pit B, where it aſcends; and as the rooms advance farther, other ſtoppings are regularly made.

In ſome of thoſe ſtoppings, on the ſides of the main headway, there muſt be doors to admit a paſſage for the bringing out of the coals from the rooms to the pit, as at 5 5: theſe doors muſt be conſtantly ſhut, except at the time of paſſing through them.

There are other methods of diſpoſing the ſtoppings ſo as to ventilate the pit; but none which will ſo effectually diſperſe the damps as that deſcribed above. If the damps are not very abundant, then the courſe of ſtopping 1 1 1, &c. in the level mine, and the others at *b b b*, &c. in the main headway, without any others, may perhaps be ſufficient to keep the pit clear. If at any time the circulation of the freſh air is not briſk enough, then a large lamp of fire may be placed at the bottom of the pit B, which, by rarefying the air there, will make a quicker circulation.

30
Of leading and ſhipping the coals.

Moſt of the larger coaleries ſend their coals to the ſhips for the coaſting trade or exportation; and, as the quantity is generally very large, it would take a greater number of carts than could conveniently be obtained at all times to carry them; beſides the conſiderable expence of that manner of carriage: they therefore generally uſe waggons, for carrying them along waggon-ways, laid with timber, by which means one horſe will draw from two to three tons at a time, when in a cart not above half a ton could be drawn.

The firſt thing to be done in making a waggon-way is to level the ground in ſuch a manner as to take off all ſudden aſcents and deſcents, to effect which, it is ſometimes neceſſary to cut through hills, and to raiſe an embankment to carry the road through hollows. The road ſhould be formed about 12 feet wide, and no part ſhould have a greater deſcent than of one yard perpendicular in 10 of a horizontal line, nor a greater aſcent than one yard in 30. After the road is formed, pieces of timber, about ſix feet long and ſix inches diameter, called *ſleepers*, are laid acroſs it, being 18 or 24 inches diſtant from each other. Upon theſe ſleepers other pieces of timber, called *rails*, of four or five inches ſquare, are laid in a lateral direction, four feet diſtant from each other, for the waggon-wheels to run upon; which being firmly pinned to the ſleepers, the road may then be filled with gravel and finiſhed.

The waggons have four wheels, either made of ſolid wood or of caſt iron. The body of the carriage is longer and wider at the top than at the bottom; and uſually has a kind of trap-door at the bottom, which, being looſed, permits the coals to run out without any trouble. The ſize of a waggon to carry 50 hundred weight of coals is as follows:

	Feet.	Inches.
Length of the top, - -	7	9
Breadth of the top, - -	5	0
Length of the bottom, -	5	0
Breadth of the bottom, -	2	6
Perpendicular height, -	4	3

Where the pits are ſituated at ſome conſiderable diſtance from the harbour, it becomes neceſſary to have a ſtore-houſe near the ſhipping place, where the coals may be lodged, until the lighters or ſhips are ready to take them in. The waggon-way ſhould be made into the ſtore-houſe, at ſuch a height from the ground, as to permit the coals to run from the waggons down a ſpout into the veſſels; or elſe to fall down into the ſtore-houſe, as occaſion may require.

This kind of ſtore-houſe is well adapted to diſpatch and ſaving expence; for a waggon load of coals may be delivered either into the ſtore-houſe or veſſels inſtantly with very little trouble: and if the coals were expoſed to the effects of the ſun and rain, they would be greatly injured in their quality; but being lodged under cover of the ſtore-houſe, they are preſerved.

COALESCENCE, the union or growing together of two bodies before ſeparate. It is principally applied to ſome bones in the body, which are ſeparate during infancy, but afterwards grow together; or to ſome morbid union of parts, which ſhould naturally be diſtinct from each other. Thus there is a coaleſcence of the ſides of the vulva, anus, and nares; of the eye-lids, fingers, toes, and many other parts.

COALLIER, a veſſel employed to carry coals from one port to another, chiefly from the nothern parts of England to the capital, and more ſoutherly parts, as well as to foreign markets. This trade is known to be an excellent nurſery for ſeamen, although they are often found, from the conſtitution of their climate, not to be ſo well calculated for ſouthern navigation.

COAMINGS, in ſhip-building, are thoſe planks, or that frame, forming a border round the hatches, which raiſe them up higher than the reſt of the deck. Loop-holes for muſkets to ſhoot out at are often made in the coamings, in order to clear the deck of the enemy when the ſhip is boarded.

COANE, among the Greeks, a name given to a peculiar ſpecies of *tutia* or tutty, which was always found in a tubular form. It had its name from κωνη, a word uſed to expreſs a ſort of cylindric tube, into which the melted braſs was received from the furnace, and in which it was ſuffered to cool. In cooling, it always depoſited a ſort of recrement on the ſides of the veſſel or tube, and this was the tutty called coane.

COAST, a ſea-ſhore, or the country adjoining to the edge of the ſea. Dr Campbell, in his political ſurvey of Great Britain, conſiders an extenſive ſea-coaſt as of great advantage to any kingdom; and conſequently that this iſland hath many conveniences reſulting from the extent of its coaſts, ſuperior to other kingdoms which are much larger. The chief advantages ariſing from an extenſive ſea-coaſt are, that thus there is a convenient opportunity for exportation and importation to or from all parts of the kingdom. Thus, a number of cities are formed on the coaſts; by this means the internal parts are improved, &c. The extent of the ſea-coaſts of Arabia, he looks upon as the genuine ſource of wealth and ſplendour to the ancient inhabitants of that peninſula; the ſame was the inſtrument of the greatneſs of ancient Egypt, of Phœnicia, &c. In ſhort, according to him, no country or city can for any length of time be flouriſhing unleſs

COAL MINES

Plate CXLIX.

Fig. 1.

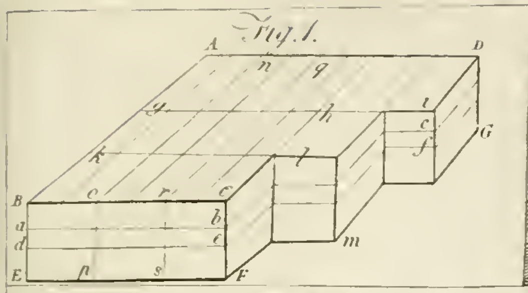


Fig. 2.

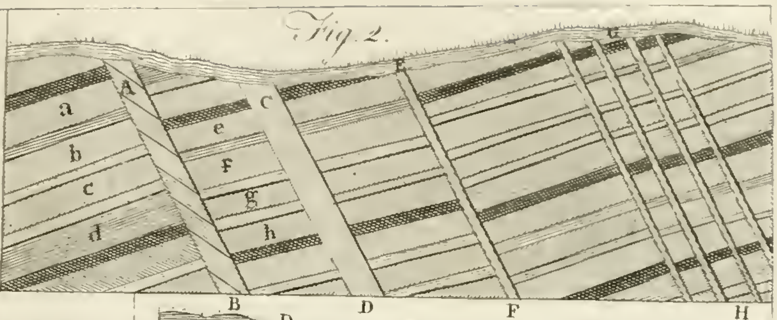


Fig. 3.

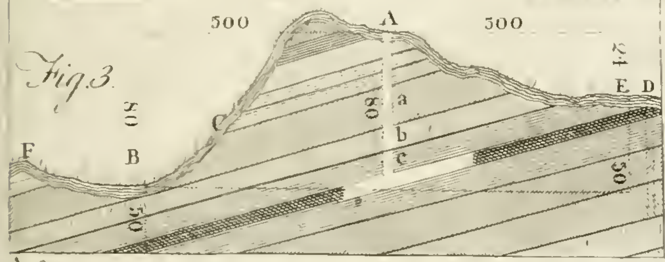


Fig. 4.

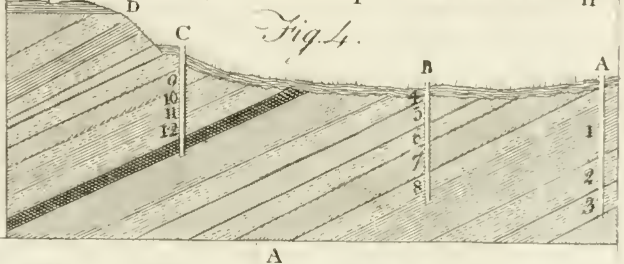


Fig. 5.

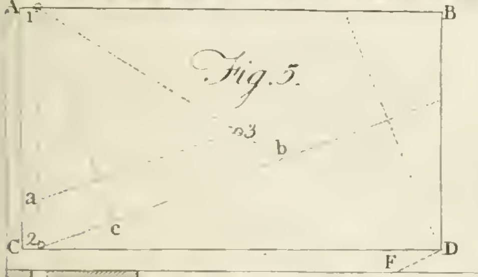


Fig. 7.

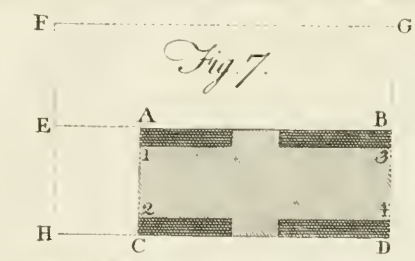


Fig. 8.

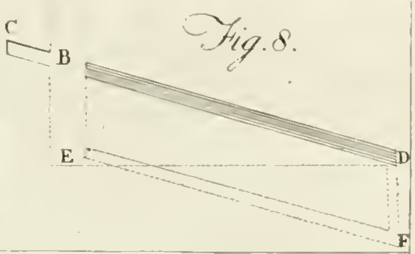
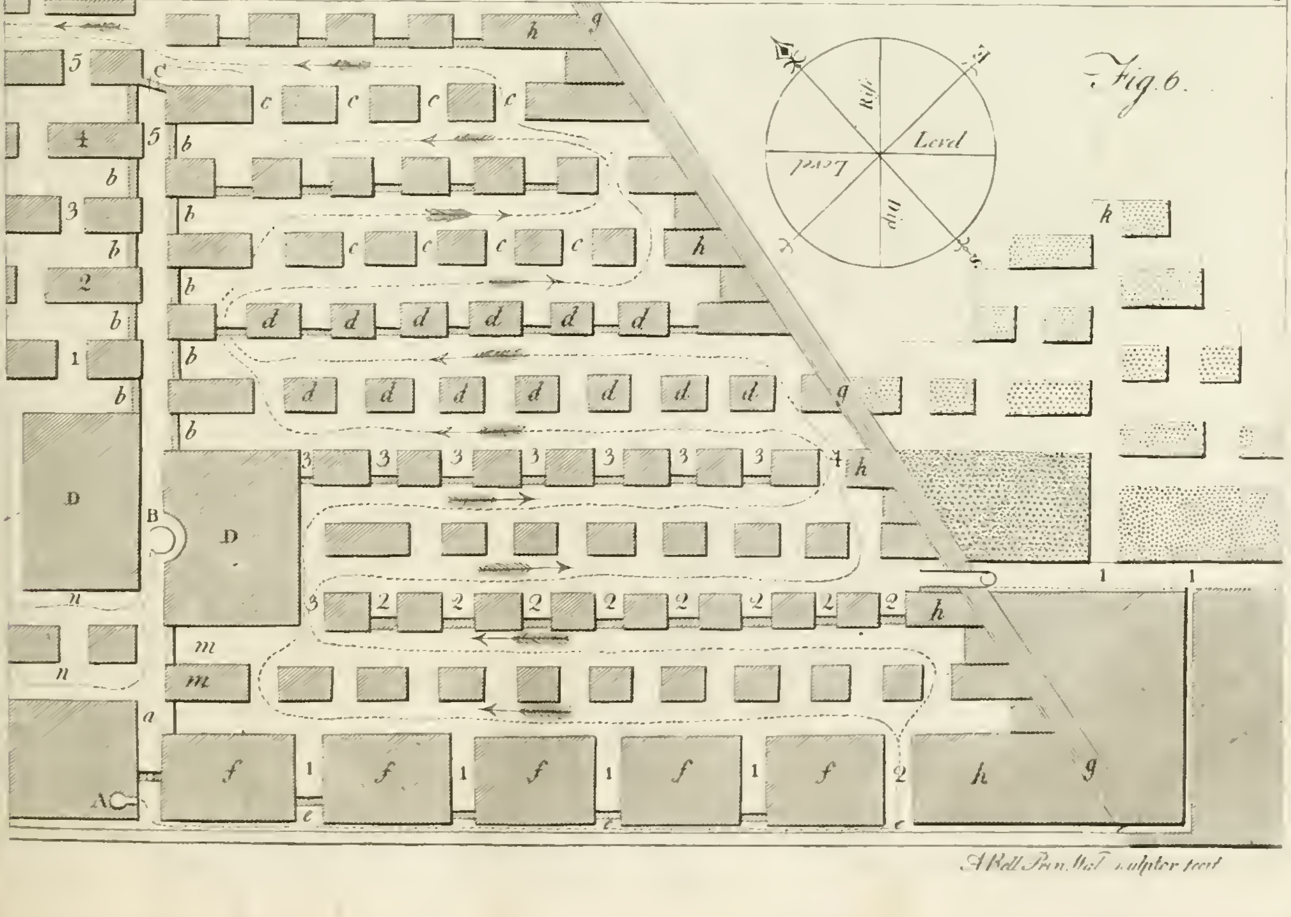


Fig. 6.



A Bell Prin. Wal. sculptor fecit

unleſs it hath conſiderable connexion with the ſea. “ It is indeed true (ſays he) that the wiſdom and induſtry of man, taking hold of ſome peculiar circumſtances, may have rendered a few inland cities and countries very fair and flouriſhing. In ancient hiſtory we read of Palmyra, and the diſtrict round it, becoming a luxuriant paradiſe in the midſt of inhoſpitable deſerts. But this was no more than a temporary grandeur; and it has now lain for ſome ages in ruins. The city and principality of Candahar was in like manner rendered rich and famous, in conſequence of its being made the centre of the Indian commerce; but long ago declining, its deſtruction has been completed in our days, from that dreadful deſolation which Thamas Kouli Khan ſpread through Perſia and the Indies. Here, in Europe, many of the large cities in Germany, which for a time made a great figure from the freedom and induſtry of the inhabitants, and diffuſed eaſe, plenty, and proſperity, through the diſtricts dependent on them, which of courſe rendered them populous, are now ſo much ſunk through inevitable accidents, as to be but ſhadows of what they were; and though they ſtill continue to ſubſiſt, ſubſiſt only as the melancholy monuments of their own misfortunes. We may therefore, from hence, with great certainty diſcern, that all the pains and labour that can be beſtowed in ſupplying the defect of ſituation, in this reſpect, proves, upon the whole, but a tedious, difficult, and precarious expedient. But, however, we muſt at the ſame time admit, that it is not barely the poſſeſſion even of an extended coaſt that can produce all theſe deſirable effects. That coaſt muſt likewiſe be diſtinguiſhed by other natural advantages, ſuch as capes and promontories, favourably diſpoſed to break the fury of the winds; deep bays, ſafe roads, and convenient harbours. For, without theſe, an extended coaſt is no more than a maritime barrier againſt the maritime force of other nations; as is the caſe in many parts of Europe, and is one of the principal reaſons why Africa derives ſo little benefit from a ſituation which has ſo promiſing an appearance; there being many conſiderable tracts upon its coaſts equally void of havens and inhabitants, and which afford not the ſmalleſt encouragement to the attempting any thing that might alter their preſent deſolate condition. It is, however, a leſs inconvenience, and in ſome caſes, no inconvenience at all, if, in the compaſs of a very extended coaſt, there ſhould be ſome parts difficult or dangerous of acceſs, provided they are not altogether inacceſſible.—The ſea-coaſt of Britain, from the figure, in ſome meaſure, of the iſland, but chiefly from the inlets of the ſea, and the very irregular indented line which forms its ſhore, comprehends, allowing for thoſe ſinuoſities, at leaſt 800 marine leagues; we may, from hence, therefore, with ſafety affirm, that in this reſpect it is ſuperior to France, though that be a much larger country; and equal to Spain and Portugal in this circumſtance, though Britain is not half the ſize of that noble peninſula, which is alſo ſingularly happy in this very particular.”

Cape-Coast, the name of the chief Britiſh ſettlement on the coaſt of Guinea, in Africa. The name is thought to be a corruption of *Cabo Corſo*, the ancient Portugueſe appellation. This cape is formed by an angular point, waſhed on the ſouth and eaſt by the ſea, on which ſtands the Engliſh fort. Here the Portugueſe ſettled in 1610, and built the citadel of Cape-Coaſt upon a large rock that projects into the ſea. A few years afterwards they were diſlodged by the Dutch, to whom this place is principally indebted for its ſtrength. In 1664 it was demoliſhed by Admiral Holmes, and in 1665 the famous Dutch Admiral De Ruyter was ordered by the States to revenge the inſults of the Engliſh. With a ſquadron of 13 men of war, he attacked all the Engliſh ſettlements along the coaſt; ruined the factories; and took, burnt, and ſunk all the ſhipping of the Engliſh Company: however, after all his efforts, he was baffled in his attempts on Cape-Coaſt. By the treaty of Breda it was confirmed to the Engliſh, and the king granted a new charter in 1672; on which the Company applied all their attention to the fortifying and rendering it commodious.

COASTING, in *Navigation*, the act of making a progreſs along the ſea-coaſt of any country. The principal articles relating to this part of navigation, are, the obſerving the time and direction of the tide; knowledge of the reigning winds; of the roads and havens; of the different depths of the water, and qualities of the ground.

Coasting Pilot, a pilot who by long experience has become ſufficiently acquainted with the nature of any particular coaſt, and of the requiſites mentioned in the preceding article, to conduct a ſhip or fleet from one part of it to another.

COAT, or coat of arms, in *Heraldry*, a habit worn by the ancient knights over their arms both in war and tournaments, and ſtill borne by heralds at arms. It was a kind of fur-coat, reaching as low as the navel, open at the ſides, with ſhort ſleeves, ſometimes furred with ermine and hair, upon which were applied the armories of the knights embroidered in gold and ſilver, and enamelled with beaten tin coloured black, green, red, and blue; whence the rule never to apply colour on colour, nor metal on metal. The coats of arms were frequently open, and diverſified with bands and fillets of ſeveral colours, alternately placed, as we ſtill ſee cloths ſcarleted, watered, &c. Hence they were called deviſes, as being divided and compoſed of ſeveral pieces ſewed together; whence the words *feſs*, *pale*, *chevron*, *bend*, *croſs*, *ſaltier*, *lozenge*, &c. which have ſince become honourable pieces, or ordinaries of the ſhield. See Cross, Bend, Chevron, &c.

Coats of arms and banners were never allowed to be worn by any but knights and ancient nobles.

Coat, in *Anatomy*. See Tunic and Eye.

Coat of Mail; a kind of armour made in form of a ſhirt; conſiſting of iron rings wove together netwiſe. See Mail.

COATI, in *Zoology*; a ſynonyme of a ſpecies of Viverra and Ursus. See Mammalia *Index*.

COATIMUNDI, a variety of the above.

Coating of Phials, *Panes of Glaſs*, &c. among electricians, is uſually performed by covering the outſide of the phial with tinfoil, braſs or gold-leaf, &c. and filling its inſide with looſe pieces of braſs-leaf, by which means it becomes capable of being *charged*. See Electricity.

COATZONTECOXOCHITL, or *Flower with the*

the viper's head, is the Mexican name of a flower of incomparable beauty. It is compoſed of five petals or leaves, purple in the innermoſt part, white in the middle, the reſt red but elegantly ſtained with yellow and white ſpots. The plant which bears it has leaves reſembling thoſe of the iris, but longer and larger; its trunk is ſmall and ſlim: This flower was one of the moſt eſteemed among the Mexicans. The Lincean academicians of Rome, who commented on and publiſhed the Hiſtory of Hernandez in 1651, and ſaw the paintings of this flower, with its colours, executed in Mexico, conceived ſuch an idea of its beauty, that they adopted it as the emblem of their very learned academy, denominating it *Fior di Lince*.

COBALT, a metallic ſubſtance which was formerly claſſed with the ſemimetals. See CHEMISTRY and MINERALOGY *Index*.

COBBING, a puniſhment ſometimes inflicted at ſea. It is performed by ſtriking the offender a certain number of times on the breech with a flat piece of wood called the *cobbing-board*. It is chiefly uſed as a puniſhment to thoſe who quit their ſtation during the period of the night-watch.

COBITIS, the LOACHE, in *Ichthyology*, a genus of fiſhes belonging to the order of abdominales. See ICHTHYOLOGY *Index*. It is frequent in the ſtream near Ameſbury in Wiltſhire, where the ſportſmen, through frolic, ſwallow it down alive in a glaſs of white-wine.

COBLE, a boat uſed in the turbot fiſhery, twenty feet ſix inches long, and five feet broad. It is about one ton burthen, rowed with three pair of oars, and admirably conſtructed for encountering a mountainous ſea.

COBLENTZ, an ancient, handſome, and ſtrong town of Germany, in the electorate of Triers or Treves, ſeated at the confluence of the rivers Rhine and Moſelle, in a fertile country, with mountains covered with vineyards. It is the uſual reſidence of the elector of Treves, to whom it belongs. Over the Rhine is a bridge of twelve arches, built for the convenience of the inhabitants of Coblentz and the adjacent places. A ferry machine is conſtantly going from the city to the other ſide of the Rhine, where there is a little town and very ſtrong caſtle built on an eminence named *the rock of honour*. This machine is erected on two boats, in the form of a large ſquare gallery, encompaſſed with balluſtrades, and carries a tall flagſtaff, on which are diſplayed the arms of the electorate of Treves. It is put in motion by the ferry-man's pulling a rope, which is fixed to a ſtandard on each ſide the river. The caſtle appears to be almoſt inacceſſible to an enemy, and entirely commands the city of Coblentz. The archbiſhop's palace ſtands at the foot of this rock, and the arſenal at a little diſtance. E. Long. 7. 32. N. Lat. 50. 24.

COBOB, the name of a diſh among the Moors. It is made of ſeveral pieces of mutton wrapt up in the cawl, and afterwards roaſted in it; the poorer people, inſtead of the meat, uſe the heart, liver, and other parts of the entrails, and make a good diſh, though not equal to the former.

COBOOSE, in ſea-language, is derived from the Dutch *kambuis*, and denotes a ſort of box, reſembling a ſentry-box, uſed to cover the chimneys of ſome merchant ſhips. It generally ſtands againſt the barricade, on the fore-part of the quarter deck. It is called in the Weſt Indies *cobre vega*.

COBURG, a town of Germany in the circle of Franconia, and capital of a territory of the ſame name, with a famous college, a fort, and a caſtle. This town, with its principality, belongs to the houſe of Saxony, and the inhabitants are Proteſtants. It is ſeated on the river Itch, in E. Long. 11. 18. N. Lat. 50. 22.

COBWEB, in *Phyſiology*, the fine net-work which ſpiders ſpin out of their own bowels, in order to catch their prey. See ARANEA.

COCCEIUS, JOHN, profeſſor of theology at Bremen, was founder of a ſect called *Cocceians*: they held, amongſt other ſingular opinions, that of a viſible reign of Chriſt in this world, after a general converſion of the Jews and all other people to the true Chriſtian faith, as laid down in the voluminous works of Cocceius. He died in 1690, aged 66.

COCCINELLA, in *Zoology*, a genus of inſects of the order of coleoptera. See ENTOMOLOGY *Index*.

COCCOLOBO, in *Botany*: A genus of the trigynia order, belonging to the octandria claſs of plants; and in the natural method ranking under the 12th order, *Holoraceæ*. See BOTANY *Index*.

COCCOTHRAUSTES, the trivial name of a ſpecies of LOXIA. See ORNITHOLOGY *Index*.

COCCULUS INDICUS, the name of a poiſonous berry, too frequently mixed with malt-liquors in order to make them intoxicating; but this practice is expreſsly forbidden by act of parliament. It is the fruit of the *MENISPERMUM Cocculus*. Fiſhermen have a way of mixing it with paſte, which the fiſh ſwallow greedily, and are thereby rendered lifeleſs for a time, and float on the water. It is ſometimes uſed with ſtaveſacre, for deſtroying vermine in children's heads.

COCCUS, in *Zoology*, a genus of inſects belonging to the order of hemiptera. See ENTOMOLOGY *Index*.

COCCYGÆUS MUSCULUS. See ANATOMY, Table of the Muſcles.

COCCYX, or COCCYGIS OS. See ANATOMY *Index*.

COCHIN, a Dutch ſettlement on the coaſt of Malabar, in N. Lat. 10. 0. E. Long. 75. 30. The town is not unpleaſant, though it falls far ſhort of their ſettlement at Columbo in the iſland of Ceylon. The fortification is irregular, but ſtrong enough to reſiſt any of the Indian powers, and has 40 or 50 cannon facing the ſea. The people in this town and the country adjacent are ſubject to a ſtrange diſorder of the legs, called *Cochin* or *elephant legs*, in which the ſwelled limb is ſometimes of ſuch an enormous bulk as to have greatly the appearance both in ſhape and ſize of the leg of an elephant. According to Mr Ives, this diſorder ſeems to be merely an œdematous ſwelling, occaſioned by an impoveriſhed ſtate of the blood and juices. The perſons afflicted with this diſtemper very ſeldom apply to European ſurgeons, and thus are rarely, if ever, cured. Indeed, our author obſerves, that their application would probably be of little avail, as the only thing that could be preſcribed would be an alteration from the pooreſt to the moſt cordial and nutritious diet; and the Indians are ſo invincibly wedded to their own cuſtoms, that they would ſooner die than break through them. Of this he ſays there were ſeveral inſtances in their long paſſage to Bengal, during which ſome of the Sepoys periſhed for want of food, rather than ſave themſelves by partaking of the ſhip's proviſions after their own had been expended. Moſt of thoſe afflicted with the diſorder we ſpeak of, are unable to call any aſſiſtance, being the very pooreſt of the people, who live entirely upon a kind of fiſh called *ſardinias*, without being able to purchaſe even the ſmalleſt quantity of rice to eat along with it; their drink is alſo mere water, unleſs they ſometimes procure a draught of the ſimple unfermented juice called *toddy*. Cochin is the principal place from whence the Dutch import their pepper into Europe.

Cochin-China, a kingdom of Aſia, bounded on the north by Tonquin; on the eaſt, by the ſea of China; on the ſouth by the Indian ocean; and on the weſt by Cambodia, and a ridge of mountains inhabited by a ſavage people called *Kemois*, who live independent of any government. Little of the hiſtory of this kindom is known. M. le Poivre, a French traveller, informs us, that about half a century before the French firſt arrived in theſe diſtant regions, a prince of Tonquin, as he fled from his ſovereign, by whom he was purſued as a rebel, had with his ſoldiers and adherents croſſed the river, which ſerves as a barrier between Tonquin and Cochin-China. The fugitives, who were warlike and civilized men, ſoon expelled the ſcattered inhabitants, who wandered about without any ſociety or form of government, and founded a new kingdom, which ſoon grew rich and populous. During the reigns of the firſt ſix kings, no nation could be happier than the Cochin-Chineſe. Their monarchs governed them as a father does his family, eſtabliſhing no laws but thoſe of nature, to which they themſelves were the firſt to pay obedience. They honoured and encouraged agriculture, as the moſt uſeful employment of mankind; and required from their ſubjects only a ſmall annual free-gift to defray the expence of their defenſive war againſt the Tonquineſe, who were their enemies. This impoſition was regulated, by way of poll-tax, with the greateſt equity. Every man, able to till the ground, paid in to the prince a ſmall ſum proportioned to the ſtrength of his conſtitution, and the vigour of his arm, and nothing more.

Cochin-China continued happy under theſe princes for more than a century; but the diſcovery of gold-mines put a ſtop to the above mild regulations. Luxury immediately took place. The prince began to deſpiſe the ſimple habitation of his anceſtors, and cauſed a ſuperb palace to be built a league in circumference, ſurrounded with a wall of brick in the model of that of Pekin, and defended by 1600 pieces of cannon. Not content with this, he would needs have a winter palace, an autumn palace, and a ſummer palace. The old taxes were by no means ſufficient to defray theſe expences; new ones were deviſed; and oppreſſion and tyranny everywhere took place. His courtiers, to flatter their prince, gave him the title of the *king of heaven*, which he ſtill continues to aſſume. When ſpeaking of his ſubjects, he ſtyles them his *children*, but by no means behaves as if he was their father; for our author informs us, that he has ſeen whole villages newly abandoned by their inhabitants, who were haraſſed with toil and inſupportable exactions; the neceſſary conſequence of which was, that their lands returned to their former uncultivated ſtate.

M. le Poivre repreſents the Cochin-Chineſe as gentle, hoſpitable, frugal, and induſtrious. There is not a beggar in the country, and robbery and murder are abſolutely unknown. A ſtranger may wander over the kingdom from one end to the other (the capital excepted) without meeting with the ſlighteſt inſult. He will be everywhere received with the moſt eager curioſity, but at the ſame time with the greateſt benevolence. A Cochin-Chineſe traveller, who has not money ſufficient to defray his expences at an inn, enters the firſt houſe of the town or village he arrives at, and waiting the hour of dinner, takes part with the family, and goes away when he thinks proper, without ſpeaking a word, or any perſon's putting to him a ſingle queſtion.

The country of Cochin-China is much of the ſame temperature with that of Tonquin; though rather milder, as lying near the ſea. Like Tonquin, it is annually overflowed, and conſequently fruitful in rice, which requires no other manure than the mud left by the inundations. They have ſugar-canes, and the ſame kinds of fruits common to other parts of India. The country produces no grapes, and therefore they drink a liquor brewed from rice. They have vaſt woods of mulberry-trees, which run up as faſt as our hemp. Their ſilk is ſtronger than that of China, but not ſo fine. They have the beſt timber in the world, particularly a ſort which abounds in the mountains, and is called the *incorruptible tree*, becauſe it never rots under earth or water, and is ſo ſolid that it ſerves for anchors. There are two kinds, black and red. The trees are very tall, ſtraight, and ſo big that two men can ſcarce graſp them. They have alſo on the mountains of the Kemois a tree of the moſt fragrant ſcent, which is ſuppoſed to be the ſame with lignum aloes. This, being reckoned the beſt product of the country, is engroſſed by the king, and is ſold from five to 16 ducats per pound. It is highly valued both in China and Japan, where the logs of it are ſold for 200 ducats a pound, to make pillows for the king and nobility; and among thoſe Indians which continue to burn their dead, great quantities of it are uſed in the funeral piles. The young trees called *aquila*, or eagle-wood, are every one's property, which makes the old ones called *calamba* ſo ſcarce and dear. They have oak, and large pines, for the building of ſhips, ſo that this country is of the ſame uſe to China that Norway is to Britain. In general, they have the ſame kind of trees and plants that are to be met with in Tonquin. They have mines of gold, as well as diamonds; but the laſt they do not value ſo high as pearl. They alſo eſteem their coral and amber very much. In all the provinces there are great granaries filled with rice, in ſome of which that grain is kept upwards of 30 years One of the greateſt rarities of theſe parts, eſpecially in grand entertainments, is a ragout made of the eatable birds neſts, which ſome ſay are found only in Cochin-China, and others in four iſlands that lie ſouth of its coaſt. See Birds-Nests.

The merchants of Cambodia, Tonquin, China, Macao, Manila, Japan, and Malacca, trade to Cochin-China with plate, which they exchange for the commodities of the country. The Portugueſe are the moſt favoured here of any Europeans. The Cochin-Chineſe themſelves, not being inclined to travel, ſeldom ſail out of ſight of their own ſhore, but purchaſe many trifles from foreigners at great rates, particularly combs, needles, bracelets, glaſs pendants, &c. They are very fond of our hats, caps, girdles, ſhirts, and other clothes; and, above all, ſet a great value on coral. The country is ſaid to have 700 miles of coaſt, with many large inlets of the ſea, and above 60 convenient landing places; which, however, according to Captain Hamilton, are but ſeldom viſited by ſtrangers.

The people of this country have a great affinity with thoſe of Tonquin, with whom they have a common origin, and from whom they differ very little in their manner of living, as well as their manners and cuſtoms, all of which they have in a great meaſure borrowed from the Chineſe. The principal exports of the country are ſilk, ſugar, ebony, and calamba-wood; gold in duſt or in bars, which is ſold for only ten times its weight in ſilver; and copper and porcelain brought from China and Japan. From this country alſo are exported the birds-neſts eſteemed ſuch a delicacy at the table. They are found in four iſlands ſituated near the coaſts of Cochin-China, to the eaſtward of which are five other ſmaller ones, where are found prodigious numbers of turtles, the fleſh of which is ſo delicate that the Tonquineſe and people of Cochin-China frequently fight deſperate battles, in order to take them from one another. The commodities which ſell moſt readily in this country are, ſaltpetre, ſulphur, lead, fine cloth, and barred or flowered chintz. Pearls, amber, and coral, were formerly in great requeſt, but at preſent only the two laſt are ſaleable; and even theſe will not anſwer unleſs the beads of coral be round, well poliſhed, and of a beautiful red colour; the amber muſt alſo be extremely clear, the beads of an equal ſize, and not larger than a hazel nut.

The only money current in Cochin-China is that of Japan, which is paid and received by weight. The money of the country is of copper and as large as our counters; of a round figure, and having a hole in the middle by which the pieces may be ſtrung like beads. Three hundred of theſe are put on one ſide, and as many on the other, which in Cochin-China paſs for a thouſand; becauſe in 600 are found ten times 60, which make a century among almoſt all the people of the eaſt. There is, however, ſcarce any country in which merchants are more apt to be deceived with regard to the value of money than Cochin-China, owing to the pieces being unequal in figure and quality, and the difficulty of determining their value, which is regulated only by a few characters ſtamped upon them. The dealers muſt therefore be at pains to have honeſt and ſkilful people to aſcertain the value of the pieces they receive, otherwiſe they run a great riſk of being deceived in their value, as the Cochin-Chineſe make a great merit of being able to cheat an European.

European merchants complain, according to M. Groſier, unjuſtly of the demands made in Cochin-China for entrance, clearance, and anchorage. The duties, indeed are very trifling, amounting only, even thoſe of the cuſtomhouſe, to 4 *per cent;* but nothing can be removed from a ſhip which arrives there until ſhe has firſt been inſpected, when the cuſtomhouſe officers unload her, weigh and count the ſmalleſt pieces, and generally take what they look upon to be moſt valuable, in order to ſend it to the king. The monarch takes what he thinks proper, and returns the value; but the grandees are ſaid to keep part of the goods alſo, without paying any thing for them. Thus the ordinary goods, which, had they been accompanied with the more valuable part of the cargo, would have found a ready market, can now ſcarcely be diſpoſed of; though our author is of opinion, that the matter is not altogether without remedy. When the Dutch ſent to this country veſſels loaded with cloths, lead, and ſaltpetre, their cargoes were ſuffered to remain entire, becauſe they had taken the precaution to pay every year a certain ſum for each veſſel that entered. Other nations, by endeavouring to avoid the payment of this duty, entirely deſtroyed their commerce: the people of Cochin China, however, for ſome years paſt, have been much more moderate in their demands; and whatever their exactions may be, they are far leſs exorbitant than thoſe of the Tonquineſe.

M. Groſier obſerves, that a falſe report has gained ground in Europe, that when a trading veſſel happens to run aground in Cochin-China, or to be driven into any of its harbours by ſtreſs of weather, the king ſeizes the cargo if the rudder be broken. He aſſures us, however, that, ſo far from this being the caſe, a veſſel in diſtreſs is much ſafer on the coaſts of Cochin-China than almoſt anywhere elſe. Barks are immediately ſent to the relief of the crew, and people employed to drag the ſea with nets in order to recover the goods that are loſt; and, in ſhort, neither labour nor expences are ſpared to put the ſhips in the beſt condition poſſible. Only two things can hurt the trade of foreigners at Cochin-China, one of which may be eaſily avoided. This regards the clearing out of veſſels. Thus, while the maſter is waiting on the evening before his departure, or on the day fixed for ſailing, in order to receive his diſpatches, it often happens that he loſes his voyage, which may prove the ruin of a trader. For this reaſon, care muſt be taken to ſolicit a clearance a month before; by which means one is always certain of obtaining it, and departing on the day appointed. The other difficulty is occaſioned by the neceſſity of ſelling goods on credit, which are ſeldom paid at the ſtipulated time. This however, is contrary to the inclination of the prince; for every merchant who can convey to him an account of theſe unjuſt delays, is ſure to be paid, and ſometimes even with intereſt.

COCHINEAL, or Cochineel, a drug uſed by the dyers, &c. for giving red colours, eſpecially crimſons and ſcarlets, and for making carmine; and likewiſe in medicine as a cardiac, cordial, ſudorific, alexipharmac, and febrifuge.

The cochineal, in the ſtate in which it is brought to us, is in ſmall bodies of an irregular figure, uſually convex, ridged and furrowed on one ſide, and concave on the other. The colour of the beſt is a purpliſh gray, powdered over with a ſort of white duſt. All that the world knew of it for a long time was, that it was gathered from certain plants in Mexico; and therefore it was naturally ſuppoſed to be a ſeed, till in the year 1692 Father Plumier gave Pomet an account

count of its being an animal. And this, though then diſregarded, has been confirmed by ſubſequent obſervations. Indeed, to determine the point, we have now the means in our own hands, even in this part of the world.—We need only moiſten and ſoak in water, or in vinegar, a number of cochineals till they are ſwelled and diſtended, to know that every one is the more or leſs perfect body of an inſect; the moſt imperfect and mutilated ſpecimens always ſhow the rings of the body; and from obſerving others, it will be eaſy to find the number and diſpoſition of the legs, parts, or even whole ones, being left on ſeveral, and often complete pairs. In this way the legs, antennæ, and proboſcis, may be diſcovered. See COCCUS above.

M. Macquer obſerves, that the cochineal of Sylveſter is gathered in the woods of Old and New Mexico. The inſect lives, grows, and multiplies on the uncultivated opuntias, which grow there in great abundance. It is there expoſed to the inclemencies of the weather, and dies naturally. The colour is more durable than that of the common cochineal, but leſs bright: but there is no advantage in uſing it; for, though cheaper, a greater quantity is requiſite.

COCHLEA, the SHELL-SNAIL. See HELIX, CONCHOLOGY *Index*.

COCHLEA, in *Anatomy*. See ANATOMY *Index*.

COCHLEARIA, SCURVY-GRASS. See BOTANY *Index*.

COCHLITES, in *Natural Hiſtory*, an appellation given to the petrified ſhells of the cochleæ or ſnails.

COCINTUM, in *Ancient Geography*, a promontory of the Bruttii, reckoned the longeſt in Italy, and which Holſtenius and Voſſius have reſtored to Ovid, reading *Cocintia* for *Ceurania*, Metam. xv. v. 704.—*Cocintum*, alſo a town, 22 miles to the ſouth of Scylaceum, almoſt on the ſpot where now *Stilo* ſtands, from which the oppoſite promontory *Cocintum* is commonly called *Capo de Stilo*.

COCK, in *Zoology*, the Engliſh name of the males of gallinaceous birds, but more eſpecially uſed for the common dunghill cock. See PHASIANUS, ORNITHOLOGY *Index*.

Black Cock. } See TETRAO, ORNITHOLOGY
Cock of the Wood. } *Index*.

Cock-Chaffer. See SCARABÆUS, ENTOMOLOGY *Index*.

Cock-Paddle, *Lump-fiſh* or *Sea-owl*. See CYCLOPTERUS, ICHTHYOLOGY *Index*.

Cock-Pit, a ſort of theatre upon which game-cocks fight.

It muſt appear aſtoniſhing to every reflecting mind, that a mode of diverſion ſo cruel and inhuman as that of cock-fighting ſhould ſo generally prevail, that not only the ancients, barbarians, Greeks, and Romans, ſhould have adopted it; but that a practice ſo ſavage and heatheniſh ſhould be continued by Chriſtians of all ſorts, and even purſued in theſe better and more enlightened times.

The ancient Greeks and Romans, as is well known, were wont to call all the nations in the world barbarians; yet certainly, if we conſider the many inſtances of cruelty practiſed among them, there was very little reaſon for the diſtinction. Human ſacrifices were common both to them and the barbarians; and with them the expoſing of infants, the combats of men with wild beaſts, and of men with men in the gladiatorial ſcenes, were ſpectacles of delight and feſtivity.

The iſlanders of Delos, it ſeems, were great lovers of cock-fighting; and Tanagra a city in Bœotia, the iſle of Rhodes, Chalcis in Eubœa, and the country of Media, were famous for their generous and magnanimous race of chickens. The kingdom of Perſia was probably included in the laſt, from whence this kind of poultry was firſt brought into Greece; and if one may judge of the reſt from the fowls of Rhodes and Media, the excellency of the broods at that time conſiſted in their weight and largeneſs (as the fowls of thoſe countries were heavy and bulky,) and of the nature of what our ſportſmen call *ſhakebags* or *turnpokes*. The Greeks, moreover, had ſome method of preparing the birds for battle, by feeding; as may be collected from Columella.

It ſhould ſeem, that at firſt cock-fighting was partly a religious and partly a political inſtitution at Athens; and was there continued for the purpoſe of improving the ſeeds of valour in the minds of their youth; but was afterwards abuſed and perverted both here and in the other parts of Greece to a common paſtime, without any moral, political, or religious intention, and as it is now followed and practiſed among us.

At Rome, as the Romans were prone to imitate the Greeks, we may expect to find them following their example in this mode of diverſion, and in the worſt way, viz. without any good or laudable motives, ſince when they took and brought it to Rome, the Greeks had forgotten every thing that was commendable in it, and had already perverted it to a low and unmeaning ſport. Signior Hyam thinks the Romans borrowed the paſtime from Dardanus, in Aſia; but there is little reaſon for making them go ſo far for it, when it was ſo generally followed in Greece, whoſe cuſtoms the Romans were addicted to borrow and imitate. However, it is probable, they did not adopt this opinion very early. It may be gathered from Columella, that the Romans did not uſe the ſport in his time. This author ſtyles cock-fighting a *Grecian diverſion*; and ſpeaks of it in terms of ignominy, as an expenſive amuſement, unbecoming the frugal houſeholder, and often attended with the ruin of the parties that followed it. The words are remarkable. "Nos enim cenſemus inſtituere vectigal induſtrii patris familias, non rixoſarum avium laniſtæ, cujus plerumque totum patrimonium pignus aleæ, victor gallinaceus pyctes abſtulit:" When he deſcribes, as we think, the manner, not of the Romans, but of the Greeks, who had in his time converted the diverſion of cock-fighting into a ſpecies of gaming, and even to the total ruin of their families, as happens but too often in England at this day. The Romans, however, at laſt gave into the cuſtom, though not till the decline of the empire. The firſt cauſe of contention between the two brothers Baſſianus and Geta, ſons of the emperor Septimus Severus, happened, according to Herodian, in their youth, about the fighting of their cocks; and if the battling between theſe two princes was the firſt inſtance of it, probably they had ſeen and learned it in Greece, whither they had often accompanied the emperor their father.

It is obſervable, that cocks and quails pitted for the purpoſe of engaging one another, *à outrance*, or to the laſt gaſp, for diverſion, are frequently compared, and with much propriety, to gladiators. Hence Pliny's expreſſion, *Gallorum ——ceu gladiatorum ;* and that of Columella, *rixoſarum avium laniſtæ ; laniſta* being the proper term for the maſter of the gladiators. Conſequently one would expect, that when the bloody ſcenes of the amphitheatre were diſcarded, as they were ſoon after the Chriſtian religion became the eſtabliſhment of the empire, the wanton ſhedding of men's blood in ſport, being of too cruel and ſavage a nature to be patronized and encouraged in an inſtitution ſo harmleſs and innocent as the Chriſtian was, one might juſtly expect that the ορτυγομαχια and the αλεκτρυομαχια would have ceaſed of courſe. The fathers of the church are continually inveighing againſt the ſpectacles of the arena, and upbraiding their adverſaries with them. Theſe indeed were more unnatural and ſhocking than a main of cocks; but this, however, had a tendency towards infuſing the like ferocity and implacability in the breaſts and diſpoſitions of men.

Beſides, this mode of diverſion has been in fact the bane and deſtruction of thouſands here, as well as of thoſe *laniſtæ avium*, "cock-feeders," mentioned by Columella, whoſe patrimonial fortunes were totally diſſipated and deſtroyed by it.

The cock is not only an uſeful animal, but ſtately in his figure, and magnificent in his plumage. "*Imperitant ſuo generi*, ſays Pliny, *et regnum* in quacunque ſunt domo, *exercent*." Ariſtophanes compares him to the king of Perſia; moſt authors alſo take notice of the "ſpectatiſſimum inſigne, ferratum, quod eorum verticem *regiæ coronæ modo* exornat." His tenderneſs towards his brood is ſuch, that, contrary to the cuſtom of many other males, he will ſcratch and provide for them with an aſſiduity almoſt equal to that of the hen; and his generoſity is ſo great, that, on finding a hoard of meat, he will chuckle the hens together, and without touching one bit himſelf will relinquiſh the whole of it to them. He was called *the bird*, κατ' ἐξοχην, by many of the ancients; he was highly eſteemed in ſome countries, and in others was even held ſacred, inſomuch that one cannot but regret that a creature ſo uſeful and noble, ſhould, by a ſtrange fatality, be ſo enormouſly abuſed by us. It is true, our αλεκτρυονομαχια, or the maſſacre of Shrove Tueſday, is now in a declining way; and, in a few years, it is to be hoped, will be totally diſuſed; but the cock-pit ſtill continues a reproach to the humanity of Engliſhmen, and to their religion; the pureſt, the tendereſt and moſt compaſſionate, of all others, not excepting even the Brachmannic.

It is unknown when the pitched battle firſt entered England, but it was probably brought thither by the Romans. This bird was here before Cæſar's arrival, but no notice of his fighting occurs earlier than the time of William Fitz-Stephen, who wrote the life of Archbiſhop Becket, ſome time in the reign of Henry II. and deſcribes the cocking as a ſport of ſchool-boys on Shrove Tueſday. From this time at leaſt the diverſion, however abſurd, and even impious, was continued amongſt us. It was followed, though diſapproved and prohibited, 39 Edward III.; alſo in the reign of Henry VIII. and A. D. 1569. It has by ſome been called a *royal diverſion*; and, as every one knows, the cock-pit at Whitehall was erected by a crowned head, for the more magnificent celebration of it. There was another pit in Drury-lane, and another in Javin-ſtreet. It was prohibited, however, by one of Oliver's acts, March 31. 1664. What aggravates the reproach and diſgrace upon Engliſhmen, are thoſe ſpecies of fighting which are called the *battle-royal* and the *Welſh-main*, known nowhere in the world but there; neither in China, nor in Perſia, nor in Malacca, nor among the ſavage tribes in America. Theſe are ſcenes ſo bloody as almoſt to be too ſhocking to relate; and yet, as many may not be acquainted with the horrible nature of them, it may be proper for the excitement of our averſion and deteſtation to deſcribe them in a few words. In the former, an unlimited number of fowls are pitted, and when they have ſlaughtered one another for the diverſion (*Dii boni !*) of the otherwiſe generous and humane Engliſhman, the ſingle ſurviving bird is to be eſteemed the victor, and carries away the prize. The Welſh-main conſiſts we will ſuppoſe of 16 pairs of cocks; of theſe, the 16 conquerors are pitted a ſecond time; the 8 conquerors of theſe are pitted a third time; the 4 conquerors the fourth time; and laſtly, the two conquerors of theſe are pitted the fifth time; ſo that (incredible barbarity) 31 cocks are ſure to be moſt inhumanly murdered for the ſport and pleaſure, the noiſe and nonſenſe, the profane curſing and ſwearing, of thoſe who have the effrontery to call themſelves, with all theſe bloody doings, and with all this impiety about them, *Chriſtians ;* nay, what with many is a ſuperior and diſtinct character, men of benevolence and morality. But let the morality and benevolence of ſuch be appreciated from the following inſtance recorded as authentic in the obituary of the Gentleman's Magazine for April 1789. "Died, April 4. at Tottenham, John Ardeſoif, Eſq; a young man of large fortune, and in the ſplendor of his carriages and horſes rivalled by few country gentlemen. His table was that of hoſpitality, where it may be ſaid he ſacrificed too much to conviviality; but if he had his foibles, he had his merits alſo that far outweighed them. Mr Ardeſoif was very fond of cock-fighting, and had a favourite cock upon which he had won many profitable matches. The laſt bet he laid upon this cock he loſt; which ſo enraged him, that he had the bird tied to a ſpit and roaſted alive before a large fire. The ſcreams of the miſerable animal were ſo affecting, that ſome gentlemen who were preſent attempted to interfere, which ſo enraged Mr Ardeſoif, that he ſeized a poker, and with the moſt furious vehemence declared, that he would kill the firſt man who interpoſed; but, in the midſt of his paſſionate aſſeverations, he fell down dead upon the ſpot. Such, we are aſſured, were the circumſtances which attended the death of this great pillar of humanity."

Cock-pit, of a ſhip of war, the apartment of the ſurgeon and his mates, being the place where the wounded men are dreſſed in time of battle, or otherwiſe. It is ſituated under the lower deck.

COCKBURNE, Mrs Catharine, a moſt accompliſhed lady and celebrated writer, was the daughter of Captain David Trotter, a native of Scotland, and a ſea-commander in the reign of King Charles II. She was born in London, Auguſt 16. 1679, and baptized in the Proteſtant church, according to which ſhe was bred up. She gave early marks of her genius; and learned to write, and alſo made herſelf miſtreſs of the French language, by her own application and diligence without any inſtructor; but ſhe had ſome aſſiſtance in the ſtudy of the Latin grammar and logic, of which latter ſhe drew up an abſtract for her own uſe. The moſt ſerious and important ſubjects, and eſpecially religion, ſoon engaged her attention.—But notwithſtanding her education, her intimacy with ſeveral families of diſtinction of the Romiſh perſuaſion, expoſed her, while very young, to impreſſions in favour of that church, which not being removed by her conferences with ſome eminent and learned members of the church of England, ſhe embraced the Romiſh communion, in which ſhe continued till the year 1707. In 1695 ſhe produced a tragedy called *Agnes de Caſtro*, which was acted at the theatre-royal when ſhe was only in her 17th year. The reputation of this performance, and the verſes which ſhe addreſſed to Mr Congreve upon his Mourning Bride in 1697, were probably the foundation of her acquaintance with that celebrated writer. Her ſecond tragedy, Fatal Friendſhip, was acted in 1698, at the new theatre in Lincoln's-Inn Fields. This tragedy met with great applauſe, and is ſtill thought the moſt perfect of her dramatic performances. Her dramatic talents not being confined to tragedy, ſhe brought upon the ſtage, in 1701, a comedy called *Love at a Loſs*, or *Moſt votes carry it*. In the ſame year ſhe gave the public her third tragedy, entitled the *Unhappy Penitent*, acted at the theatre-royal in Drury-lane. But poetry and dramatic writing did not ſo far engroſs the thoughts of our author, but that ſhe ſometimes turned them to ſubjects of a very different nature, and diſtinguiſhed herſelf in an extraordinary manner in defence of Mr Locke's writings, a female metaphyſician being a remarkable phenomenon in the republic of letters.

She returned to the exerciſe of her dramatic genius in 1702, and fixed upon the revolution of Sweden, under Guſtavus Erickſon, for the ſubject of a tragedy. This tragedy was acted in 1706, at the queen's theatre in the Hay-Market. In 1707, her doubts concerning the Romiſh religion, which ſhe had ſo many years profeſſed, having led her to a thorough examination of the grounds of it by conſulting the beſt books on both ſides of the queſtion, and adviſing with men of the beſt judgment, the reſult was a conviction of the falſeneſs of the pretenſions of that church, and a return to that of England, to which ſhe adhered during the remainder of her life. In 1708 ſhe was married to the Rev. Mr Cockburne, then curate of St Dunſtan's in Fleet-ſtreet, but he afterwards obtained the living of Long-Horſely, near Morpeth in Northumberland. He was a man of conſiderable abilities; and, among ſeveral other things, wrote an account of the Moſaic Deluge, which was much approved by the learned.

Mrs Cockburne's remarks upon ſome writers in the controverſy concerning the foundation of moral duty and moral obligation, were introduced to the world in Auguſt 17[illegible], in the Literary Journal, entitled, *The Hiſtory of the Works of the Learned.* The ſtrength, clearneſs, and vivacity ſhown in her remarks upon the moſt abſtract and perplexed queſtions, immediately raiſed the curioſity of all good judges about the concealed writer; and their admiration was greatly increaſed when her ſex and advanced age were known. Dr Rutherford's Eſſay on the Nature and Obligations of Virtue, publiſhed in May 1744, ſoon engaged her thoughts; and notwithſtanding the aſthmatic diſorder which had ſeized her many years before, and now left her ſmall intervals of eaſe, ſhe applied herſelf to the confutation of that elaborate diſcourſe, and finiſhed it with a ſpirit, elegance, and perſpicuity equal, if not ſuperior, to all her former writings.

The loſs of her huſband in 1748, in the 71ſt year of his age, was a ſevere ſhock to her; and ſhe did not long ſurvive him, dying on the 11th of May 1740, in her 71ſt year, after having long ſupported a painful diſorder with a reſignation to the Divine will, which had been the governing principle of her whole life, and her ſupport under the various trials of it.

Her works are collected into two large volumes 8vo by Dr Birch, who has prefixed to them an account of her Life and Writings.

COCKERMOUTH, a town of Cumberland in England, ſituated in W. Long. 3. 12. N. Lat. 54. 35. It is a large town, irregularly built, with broad ſtreets. It is waſhed by the Derwent on the weſtern ſide; divided in two by the Cocker; and the parts are connected by a ſtone-bridge of a ſingle arch. The number of inhabitants is between three and four thouſand: the manufactures are ſhalloons, worſted ſtockings, and hats; the laſt exported from Glaſgow to the Weſt Indies. It is a borough-town, and the right of voting is veſted by burgeſs tenure in certain houſes: this is alſo the town where the county elections are held.—Here is a caſtle ſeated on an artificial mount on a bank above the Derwent. It is a ſquare building, and ſtrengthened with ſeveral ſquare towers: on each ſide of the inner gate are two deep dungeons capable of holding 50 perſons in either. They are vaulted at top, and have only a ſmall opening in order to lower through it the unhappy victims into this dire priſon; and on the outſide of each is a narrow ſlit with a ſlope from it, down which were put the proviſions allotted for the wretched inhabitants. This caſtle was founded by Waldof, firſt lord of Allerdale, and ſon of Goſpatrick earl of Northumberland, cotemporary with William the Conqueror. Waldof reſided firſt at Papcaſtle, which he afterwards demoliſhed; and with the materials built that at Cockermouth, where he and his family long reſided; but ſeveral arms over the gateway, which Camden ſays are thoſe of the *Multons*, *Humfranvilles*, *Lucies*, and *Percies*, evince it to have belonged in later times to thoſe families. It appears that it was firſt granted by Edward II. to Anthony de Lucie, ſon of Thomas de Multon, who had aſſumed that name, becauſe his mother was daughter and co-heireſs to Richard de Lucie; and afterwards, by marriages, this caſtle and its honours deſcended to the Humfranvilles, and finally to the Percies. In 1658, it was garriſoned for the king; and being beſieged and taken by the rebels, was burnt, and never afterwards repaired.—Cockermouth is now in the poſſeſſion of the Lowther family, who have here a great property in coal-works. The town ſends two members to parliament.

COCKET, is a ſeal belonging to the king's cuſtomhouſe, or rather a ſcroll of parchment ſealed and delivered by the officers of the cuſtoms to merchants, as a warrant that their merchandiſes are cuſtomed.

It is alſo uſed for the office where goods tranſported were firſt entered, and paid their cuſtom, and had a cocket or certificate of diſcharge.

COCKLE. See Cardium, Conchology *Index*.

Cockle, *Schorl*, or *Shirle*, in *Mineralogy*, a ſpecies of ſtones, belonging to the ſiliceous claſs. See Mineralogy *Index*.

COCKNEY, a very ancient nickname for a citizen of London. Ray ſays, an interpretation of it is, A young perſon coaxed or cockered, made a wanton, or neſtle-cock, delicately bred and brought up, ſo as when arrived at man's eſtate to be unable to bear the leaſt hardſhip. Another, A perſon ignorant of the terms of country economy, ſuch as a young citizen, who having been ridiculed for calling the neighing of a horſe laughing, and told that it was called neighing, next morning, on hearing the cock crow, to ſhow inſtruction was not thrown away upon him, exclaimed to his former inſtructor, How that cock neighs! whence the citizens of London have ever ſince been called cockneighs, or cockneys. Whatever may be the origin of this term, we at leaſt learn from the following verſes, attributed to Hugh Bagot earl of Norfolk, that it was in uſe in the time of King Henry II.

Was I in my caſtle at Bungay,
Faſt by the river Waveney,
I would not care for the king of Cockney.
(i. e. the king of London.)

The king of the cockney occurs among the regulations for the ſports and ſhows formerly held in the Middle Temple, on Childermas day, where he had his officers, a marſhal, conſtable, butler, &c. See Dugdale's *Origines Juridicales*, p. 247.

COCKROACH. See Blatta. In Captain Cook's laſt voyage, the ſhips, while at Huaheine, were infeſted with incredible numbers of theſe creatures, whom it was found impoſſible by any means to deſtroy. Every kind of food, when expoſed only for a few minutes, was covered with theſe noxious inſects, and pierced ſo full of holes, that it reſembled a honey comb. They were particularly deſtructive to birds which had been ſtuffed for curioſities, and were ſo fond of ink, that they ate out the writing on labels. Books, however, were ſecured from their ravages by the cloſeneſs of the binding, which prevented them from getting in between the leaves. They were of two kinds, the *Blatta Orientalis* and *Germanica*.

COCKSWAIN, or Cockson, an officer on board a man of war, who hath the care of the boat or ſloop, and all things belonging to it. He is to be always ready with his boat's gang or crew, and to man the boat on all occaſions. He ſits in the ſtern of the boat, and ſteers; and hath a whiſtle to call and encourage his men.

COCLES, Pub. Horatius, a celebrated Roman, who alone oppoſed the whole army of Porſenna at the head of a bridge, while his companions behind him were cutting off the communication with the other ſhore. When the bridge was deſtroyed, Cocles, though wounded by the darts of the enemy, leapt into the Tiber, and ſwam acroſs it with his arms. A brazen ſtatue was raiſed to him in the temple of Vulcan, by the conſul Publicola, for his eminent ſervices.

COCOA. See Cocos, Botany *Index*.

COCONATO, a town of Piedmont in Italy, famous for being the birth-place of Columbus, who firſt diſcovered America. E. Long. 8. 0. N. Lat. 44. 50.

COCOS, in *Botany*; a genus belonging to the natural order of *Palmæ*. See Botany *Index*.

COCTION, a general term for all alterations made in bodies by the application of fire or heat.

COCYTUS, one of the rivers of hell, according to the theology of the poets. It has its name απο τȣ κωκυειν, from groaning and lamenting. Hence Milton,

Cocytus nam'd of lamentation loud,
Heard on the rueful ſtream.

It was a branch of the river Styx; and flowed, according to Horace, with a dull and languid ſtream.

COD, in *Ichthyology*. See Gadus and Fishery.

Cod is alſo a term uſed, in ſome parts of the kingdom, for a pod. See Pod.

Cod-Cape, a promontory on the coaſt of New England, near the entrance of Boſton harbour. W. Long. 69. 50. N. Lat. 42. 0.

CODDY MODDY, the Engliſh name of a ſpecies of Larus.

CODE (*codex*), a collection of the laws and conſtitutions of the Roman emperors, made by order of Juſtinian. The word comes from the Latin *codex*, "a paper book;" ſo called *à codicibus*, or *caudicibus arborum*, "the trunks of trees;" the bark whereof being ſtripped off, ſerved the ancients to write their books on.

The code is accounted the ſecond volume of the civil law, and contains twelve books; the matter of which is nearly the ſame with that of the digeſts, eſpecially the firſt eight books; but the ſtyle is neither ſo pure, nor the method ſo accurate, as that of the digeſts; and it determines matters of daily uſe, whereas the digeſts diſcuſs the more abſtruſe and ſubtle queſtions of the law, giving the various opinions of the ancient lawyers. Although Juſtinian's code is diſtinguiſhed by the appellation of *code*, by way of eminence, yet there were codes before his time: ſuch were, 1. The Gregorian code, and Hermogenean code, collections of the Roman laws, made by two famous lawyers, Gregorius and Hermogenes, which included the conſtitutions of the emperors from Adrian to Diocleſian and Maximinus. 2. The Theodoſian code, compriſed in 16 books, formed out of the conſtitutions of the emperors from Conſtantine the Great to Theodoſius the Younger: this was obſerved almoſt over all the weſt, till it was abrogated by the Juſtinian code. There are alſo ſeveral later codes, particularly the ancient Gothic, and thoſe of the French kings; as the code of Euridic, code-Lewis, code-Henry, code-Marchande, code des Eaux, &c.; and the preſent King of Pruſſia has lately publiſhed a code, which compriſes the laws of his kingdom in a very ſmall volume.

CODEX, in antiquity, denotes a book or tablet on which the ancients wrote. See Code.

Codex alſo denoted a kind of puniſhment by means of a clog or block of wood, to which ſlaves who had offended were tied faſt, and obliged to drag it along with them; and ſometimes they ſat on it cloſely bound.

CODIA, among botaniſts, ſignifies the head of any plant, but more particularly a poppy head; whence its ſyrup is called *diacodium*.

CODICIL, is a writing, by way of ſupplement to a will, when any thing is omitted that the teſtator would have added, or wants to be explained, altered, or recalled.

CODLIN, an apple uſeful in the kitchen, being the moſt proper for baking.

CODLING, an appellation given to the young cod-fiſh. See Gadus, Ichthyology *Index*.

CODON (Κωδων), in antiquity, a cymbal, or rather little braſs bell, reſembling the head of a poppy. They were faſtened to the trappings and bridles of horſes.

CODRINGTON, Ghristopher, a brave Engliſh officer, and not leſs diſtinguiſhed for his learning and benevolence, was born at Barbadoes in the year 1668, and educated at Oxford; after which he betook himſelf to the army; and by his merit and courage, ſoon recommending himſelf to the favour of King William, was made a captain in the firſt regiment of foot-guards. He was at the ſiege of Namur in 1695; and, upon the concluſion of the peace of Ryſwick, was made captain-general and governor in chief of the Leeward and Caribbee iſlands. However, in 1701, ſeveral articles were exhibited againſt him to the houſe of commons in England; to which he publiſhed a diſtinct and particular anſwer, and was honourably acquitted of all imputations. In 1703, he ſhowed great bravery at the attack of Guadaloupe, but at laſt he reſigned his government, and lived a ſtudious retired life; for a few years before his death, he chiefly applied himſelf to church-hiſtory and metaphyſics. He died at Barbadoes on the 7th of April 1710, and was buried there the day following; but his body was afterwards brought over to England, and interred on the 19th of June 1716, in the chapel of All-Souls College, Oxford. By his laſt will, he bequeathed his plantations in Barbadoes, and part of the iſland of Barbuda, to the ſociety for propagating the goſpel in foreign parts; and left a noble legacy to All-Souls College, of which he had been a fellow. This legacy conſiſted of his library, which was valued at 6000l.; and 10,000l, to be laid out, 6000 in building a library, and 4000 in furniſhing it with books. He wrote ſome of the poems in the *Muſæ Anglicanæ*, printed at London in 1741.

CODRUS, the 17th and laſt king of Athens, ſon of Melanthus. When the Heraclidæ made war againſt Athens, the oracle ſaid that the victory would be granted to that nation whoſe king was killed in battle. The Heraclidæ upon this gave ſtrict orders to ſpare the life of Codrus; but the patriotic king diſguiſed himſelf and attacked one of the enemy, by whom he was killed. The Athenians obtained the victory, and Codrus was deſervedly called the father of his country. He reigned 21 years, about 2153 years before the Chriſtian era. To pay more honour to his memory, the Athenians made a reſolution that no man after Codrus ſhould reign in Athens under the name of *king*.

COECUM, or blind gut. See Anatomy *Index*.

Dr Muſgrave gives us an account, in the Philoſophical Tranſactions, of the cœcum of a dog being cut out without any prejudice to the animal. Mr Giles gives us another of the cœcum of a lady being diſtended, ſo as to form a tumor that held almoſt ſix pints of a thin, grayiſh, almoſt liquid ſubſtance, of which ſhe died. And Mr Knowler a third, of a boy's cœcum being vaſtly extended and ſtuffed with cherry-ſtones, which likewiſe proved mortal.

COEFFICIENTS, in *Algebra*, are ſuch numbers or known quantities as are put before letters or quantities, whether known or unknown, and into which they are ſuppoſed to be multiplied. Thus in $3x$, ax, or bx; 3, a and b, are the coefficients of x: and in $6a$, $9b$; 6 and 9 are the coefficients of a and b. See Algebra.

COELESTIAL, or Celestial, in general, denotes any thing belonging to the heavens: thus we ſay, *celeſtial obſervations*, the *celeſtial globe*, *&c.*

COELIAC artery, in *Anatomy*, that artery which iſſues from the aorta, juſt below the diaphragm. See Anatomy *Index*.

Coeliac Vein, in *Anatomy*, that running through the inteſtinum rectum, along with the cœliac artery.

COELIMONTANA Porta (Pliny), one of the gates of Rome, ſituated at the foot of Mount Cœlius; and hence its name, thought to be the ancient *Aſinaria* by ſome; but this others doubt. By this gate Alaric with his Goths is ſaid to have entered and plundered Rome.

COELIOBRIGA, in *Ancient Geography*, a town of the Bracari in the Hither Spain, to the ſouth of Bracara Auguſta, the north of the Durius, and not far from the Atlantic; a municipium (Coin). Now thought to be *Barcelos*, a town of Entre Minho y Duero. W. Long. 9. 15. Lat. 41. 20.

COELIUS mons, one of the ſeven hills of Rome, ſo called from *Cocles*, a Tuſcan captain, who came to the aſſiſtance of Romulus againſt the Sabines, (Dionyſius Halicarnaſſus). Called alſo *Querculanus* or *Quercetulanus*, from the oaks growing on it; and *Auguſtus*, by Tiberius (Tacitus, Suetonius). To the eaſt it had the city walls, on the ſouth the Coeliolus, to the weſt the Palatine, and on the north the Eſquiliæ.

COELIOLUS, a part of Mount Cœlius to the ſouth called *Minor Cœlius* (Martial); having the city walls on the eaſt, the Aventine to the ſouth, and on the weſt and north the valley through which the rivulet of the Appia runs.

COELOMA, among phyſicians, a hollow ulcer, ſeated in the tunica cornea of the eye.

COELOS portus, in *Ancient Geography*, a town of the Cherſoneſus of Thrace, to the ſouth of Seſtos, where the Athenians erected a trophy, after a ſea victory over the Lacedemonians (Diodorus Siculus).

COELOSYRIA, in the larger ſenſe of the word, was the name of the whole country lying ſouthward of Seleucia, and extending as far as Egypt and Arabia; but this word is principally applied to the valley lying between Libanus and Antilibanus. This word occurs only in the apocryphal writings of the Old Teſtament.

COELUS (Heaven), in Pagan mythology, the ſon of Æther and Dies, or Air and Day. According to Heſiod, he married Terra or the Earth, on whom he begat Aurea or the Mountains, the Ocean, &c. But having at length impriſoned the Cyclops, who were alſo his children, his wife, being offended, incited her ſon Saturn to revenge the injury done to his brothers; and by her aſſiſtance, he bound and caſtrated Cœlus, when the blood that flowed from the wound produced the three furies, the giants, and the wood-nymphs; and the genital parts being thrown into the ſea, impregnated the waters and formed the goddeſs Venus. This deity was called by the Greeks *Uranus*.

COEMETERY. See CEMETERY.

COEMPTIONALES, among the Romans, an appellation given to old ſlaves, which were ſold in a lot with others, becauſe they could not be ſold alone.

COENOBITE, a religious who lives in a convent, or in community, under a certain rule; in oppoſition to anchoret, or hermit, who lives in ſolitude. The word comes from the Greek κοινος, *communis*; and βιος, *vita*, "life." Caſſian makes this difference between a *convent* and a *monaſtery*, that the latter may be applied to the reſidence of a ſingle religious or recluſe, whereas the *convent* implies *cœnobites*, or numbers of religious living in common. Fleury ſpeaks of three kinds of monks in Egypt; *anchorets*, who live in ſolitude; *cœnobites*, who continue to live in community; and *ſarabaites*, who are a kind of monks-errant, that ſtroll from place to place. He refers the inſtitution of cœnobites to the times of the apoſtles, and makes it a kind of imitation of the ordinary lives of the faithful at Jeruſalem. Though St Pachomius is ordinarily owned the inſtitutor of the cœnobite life, as being the firſt who gave a rule to any community.

COENOBIUM, (κοινοβιον), the ſtate of living in a ſociety, or community, where all things are common. Pythagoras is thought to be the author or firſt inſtitutor of this kind of life; his diſciples, though ſome hundreds in number, being obliged to give up all their private eſtates, in order to be annexed to the joint ſtock of the whole. The Eſſenians among the Jews, and Platoniſts, are ſaid to have lived in the ſame manner. Many of the Chriſtians alſo have thought this the moſt perfect kind of ſociety, as being that in which Chriſt and his apoſtles choſe to live.

COESFELDT, a town of Germany, in Weſtphalia, and in the territories of the biſhop of Munſter, where he often reſides. It is near the river Burkel, E. Long. 64. 2. N. Lat. 51. 58.

COEVORDEN, one of the ſtrongeſt towns in the United Provinces, in Overyſſel, fortified by the famous Cohorn. It was taken by the biſhop of Munſter, 1673; and the Dutch retook it the ſame year. It is ſurrounded by a moraſs. E. Long. 6. 41. N. Lat. 52. [illegible]

COFFEA, the COFFEE-TREE. See BOTANY *Index*. The flowers which are produced in cluſters at the root of the leaves, are of a pure white, and have a very grateful odour. The fruit, which is the only uſeful part, reſembles a cherry. When it comes to be of a deep red, it is gathered for the mill, in order to be manufactured into thoſe *coffee-beans* now ſo generally known. The mill is compoſed of two wooden rollers furniſhed with iron plates 18 inches long, and 10 or 12 in diameter. Theſe moveable rollers are made to approach a third which is fixed, and which they call the *chops*. Above the rollers is a hopper, in which they put the coffee, from whence it falls between the rollers and the chops, where it is ſtripped of its firſt ſkin, and divided into two parts, as may be ſeen by the form of it after it has undergone this operation; being flat on the one ſide and round on the other. From this machine it falls into a braſs ſieve, where the ſkin drops between the wires, while the fruit ſlides over them into baſkets placed ready to receive it: it is then thrown into a veſſel full of water, where it ſoaks for one night, and is afterwards thoroughly waſhed. When the whole is finiſhed, and well dried, it is put into another machine called the *peeling-mill*. This is a wooden grinder, turned vertically upon its trendle by a mule or horſe. In paſſing over the coffee it takes off the parchment, which is nothing but a thin ſkin that detaches itſelf from the berry in proportion as it grows dry. The parchment being removed, it is taken out of this mill to be put into another, which is called the *winnowing-mill*. This machine is provided with four pieces of tin fixed upon an axle, which is turned by a ſlave with conſiderable force; and the wind that is made by the motion of theſe plates clears the coffee of all the pellicles that are mixed with it. It is afterwards put upon a table, where the broken berries, and any filth that may remain among them, are ſeparated by negroes, after which the coffee is fit for ſale.

The coffee-tree is cultivated in Arabia, Perſia, the Eaſt Indies, the iſle of Bourbon, and ſeveral parts of America. It is alſo raiſed in botanic gardens in ſeveral parts of Europe. Prince Eugene's garden at Vienna produced more coffee than was ſufficient for his own conſumption. It delights particularly in hills and mountains, where its root is almoſt always dry, and its head frequently watered with gentle ſhowers. It prefers a weſtern aſpect, and ploughed ground without any appearance of graſs. The plants ſhould be placed at eight feet diſtance from each other, and in holes twelve or fifteen inches deep. If left to themſelves, they would riſe to the height of 16 or 18 feet, as already obſerved; but they are generally ſtinted to five, for the conveniency of gathering their fruit with the greater eaſe. Thus dwarft, they extend their branches ſo, that they cover the whole ſpot round about them. They begin to yield fruit the third year, but are not in full bearing till the fifth. With the ſame infirmities that moſt other trees are ſubject to, theſe are likewiſe in danger of being deſtroyed by a worm or by the ſcorching rays of the ſun. The hills where the coffee-trees are found have generally a gravelly or chalky bottom. In the laſt, it languiſhes for ſome time and then dies; in the former, its roots, which ſeldom fail of ſtriking between ſtones, obtain nouriſhment, and keep the tree alive and fruitful for 30 years. This is nearly the period for plants of the coffee-tree. The proprietor, at the end of this period, not only finds himſelf without trees, but has his land reduced, that it is not fit for any kind of culture; and unleſs he is ſo ſituated, that he can break up a ſpot of virgin land, to make himſelf amends for that which is totally exhauſted by the coffee-trees, his loſs is irreparable.

The coffee produced in Arabia is found ſo greatly to excel that raiſed in the American plantations or elſewhere, that the cultivation of the tree is now but ſeldom practiſed in any of the Britiſh colonies. Large plantations of this kind were formerly made in ſome of them; and it was propoſed to the parliament to give a proper encouragement for cultivating this commodity there, ſo as to enable the planters to underſell the importers from Arabia. Accordingly, there was an abatement of the duty payable on all coffee imported from our colonies in America, which at that time was ſuppoſed to be ſufficient encouragement for this kind of commerce; but the inferiority of the American coffee to the Arabian hath almoſt ruined the project. Mr Miller propoſes ſome improvements in the method of cultivation. According to him, the trees are planted in too moiſt a ſoil, and the berries are gathered too ſoon. They ought, he ſays, to be permitted to remain on the trees till their ſkins are ſhrivelled, and they fall from the trees when ſhaken. This will indeed greatly diminiſh their weight, but the value of the commodity will thereby be increaſed to more than double of that which is gathered ſooner. In Arabia, they always ſhake the berries off the trees, ſpreading cloths to receive them, and only take ſuch as readily fall at each time. Another cauſe may be the method of drying the berries. They are, he obſerves, very apt to imbibe moiſture, or the flavour of any thing placed near them. A bottle of rum placed in a cloſet, in which a caniſter of coffee-berries cloſely ſtopped was ſtanding on a ſhelf at a conſiderable diſtance, in a few days ſo impregnated the berries as to render them very diſagreeable. Some years ago, a coffee-ſhip from India had a few bags of pepper put on board, the flavour of which was imbibed by the coffee, and the whole cargo ſpoiled. For theſe reaſons coffee-berries ſhould never be brought over in ſhips freighted with rum, or laid to dry in the houſes where ſugars are boiled or rum diſtilled. When they are fully ripe, they ſhould be ſhaken off when the trees are perfectly dry, and ſpread upon cloths to dry in the ſun, carrying them every evening under cover, to prevent the dews or rain from falling on them. When perfectly dry, they ſhould have their outer ſkins beaten off, and then be carefully packed up in cloths or bags three or four times double.

Coffee alſo denotes a kind of drink, prepared from thoſe berries; very familiar in Europe for theſe 100 years, and among the Turks for 170.

Its origin is not well known. Some aſcribe it to the prior of a monaſtery, who being informed by a goat-herd, that his cattle ſometimes browzing on the tree would wake and caper all night, became curious to prove its virtue: accordingly, he firſt tried it on his monks, to prevent their ſleeping at matins. Others, from Sehehabeddin, refer the invention of coffee to the Perſians, from whom it was learned in the 15th century by Gemaleddin, mufti of Aden, a city near the mouth of the Red ſea, and who having tried its virtues himſelf, and found that it diſſipated the fumes which oppreſſed the head, inſpired joy, opened the bowels, and prevented ſleep, without being incommoded by it, recommended it firſt to his derviſes, with whom he uſed to ſpend the night in prayer. Their example brought coffee into vogue at Aden; the profeſſors of the law for ſtudy, artiſans to work, travellers to walk in the night, in fine every body at Aden, drank coffee. Hence it paſſed to Mecca, where firſt the devotees, then the reſt of the people, took it. From Arabia Felix it paſſed to Cairo. In 1511, Kahie Beg prohibited it, from a perſuaſion that it inebriated, and inclined to things forbidden. But Sultan Cauſou immediately after took off the prohibition, and coffee advanced from Egypt to Syria and Conſtantinople. The derviſes declaimed againſt it from the Alcoran, which declares, that coal is not of the number of things created by God for food. Accordingly, the mufti ordered the coffee-houſes to be ſhut; but his ſucceſſor declaring coffee not to be *coal*, they were again opened. During the war in Candia the aſſemblies of news-mongers making too free with ſtate affairs, the grand viſir Cuproli ſuppreſſed the coffee-houſes at Conſtantinople, which ſuppreſſion, though ſtill on foot, does not prevent the public uſe of the liquor there. Thevenot the traveller, was the firſt who brought it into France; and a Greek ſervant, named *Paſqua*, brought into England by Mr Dan. Edwards, a Turkey merchant, in 1652, to make his coffee, firſt ſet up the profeſſion of *coffee-man*, and introduced the drink into this iſland.

The word *coffee* is originally Arabic: the Turks pronounce it *caheub*, and the Arabians *cahuah;* which ſome authors maintain to be a general name for any thing that takes away the appetite, others for any thing that promotes appetite, and others again for any thing that gives ſtrength and vigour.—The Mahometans, it is obſerved, diſtinguiſh three kinds of *cahuah*. The firſt is wine, or any liquor that inebriates; the ſecond is made of the pods that contain the coffee-berry; this they call the *Sultan's coffee*, from their having firſt introduced it on account of its heating leſs than the berry, as well as its keeping the bowels open; the third is that made with the berry itſelf, which alone is uſed in Europe, the pods being found improper for tranſportation. Some Europeans who imported the pods, called them the *flower of the coffee-tree*. The deep brown colour of the liquor occaſioned its being called *ſyrup of the Indian mulberry*, under which ſpecious name it firſt gained ground in Europe.

The preparation of coffee conſiſts in roaſting, or giving it a juſt degree of torrefaction on an earthen or metalline plate, till it has acquired a browniſh hue equally deep on all ſides. It is then ground in a mill, as much as ſerves the preſent occaſion. A proper quantity of water is next boiled, and the ground coffee put into it. After it has juſt boiled, it is taken from the fire, and the decoction having ſtood a while to ſettle and fine, they pour or decant it into diſhes. The ordinary method of roaſting coffee amongſt us is in a tin cylindrical box full of holes, through the middle whereof runs a ſpit. Under this is a ſemicircular hearth, whereon is a large charcoal-fire: by help of a jack the ſpit turns ſwift, and ſo roaſts the berry, being now and then taken up to be ſhaken. When the oil riſes, and it is grown of a dark brown colour, it is emptied into two receivers made with large hoops, whoſe bottoms are iron plates: there the coffee is ſhaken, and left till almoſt cold; and if it look bright and oily, it is a ſign it is well done.

Very different accounts have been given of the medicinal qualities of this berry. To determine its real effects on the human body, Dr Percival has made ſeveral experiments, the reſult of which he gives in the following words: "From theſe obſervations we may infer, that coffee is ſlightly aſtringent, and antiſeptic;

that it moderates alimentary fermentation, and is powerfully ſedative. Its action on the nervous ſyſtem probably depends on the oil it contains; which receives its flavour, and is rendered mildly empyreumatic, by the proceſs of roaſting. Neumann obtained by diſtillation from one pound of coffee, five ounces five drachms and a half of water, ſix ounces and half a drachm of thick fetid oil, and four ounces and two drachms of a caput mortuum. And it is well known, that rye, torrefied with a few almonds, which furniſh the neceſſary proportion of oil, is now frequently employed as a ſubſtitute for theſe berries.

"The medicinal qualities of coffee ſeem to be derived from the grateful ſenſation which it produces in the ſtomach, and from the ſedative powers it exerts on the *vis vitæ*. Hence it aſſiſts digeſtion, and relieves the headach; and is taken in large quantities, with peculiar propriety, by the Turks and Arabians, becauſe it counteracts the narcotic effects of opium, to the uſe of which thoſe nations are much addicted.

"In delicate habits, it often occaſions watchfulneſs, tremors, and many of thoſe complaints which are denominated nervous. It has been even ſuſpected of producing palſies; and from my own obſervation, I ſhould apprehend, not entirely without foundation. Slare affirms, that he became paralytic by the too liberal uſe of coffee, and that this diſorder was removed by abſtinence from that liquor.

"The following curious and important obſervation is extracted from a letter with which I was honoured by Sir John Pringle, in April 1773: 'On reading your ſection concerning coffee, one quality occurred to me which I had obſerved of that liquor, confirming what you have ſaid of its ſedative virtues. It is the beſt abater of the paroxyſms of the periodic aſthma that I have ſeen. The coffee ought to be of the beſt Mocco, newly burnt, and made very ſtrong immediately after grinding it. I have commonly ordered an ounce for one diſh; which is to be repeated freſh after the interval of a quarter or half an hour; and which I direct to be taken without milk or ſugar. The medicine in general is mentioned by Muſgrave, in his treatiſe *De arthritide anomola;* but I firſt heard of it from a phyſician in this place, who having once practiſed it in Litchfield, had been informed by the old people of that place, that Sir John Floyer, during the latter years of his life, kept free from, or at leaſt lived eaſy under, his aſthma, from the uſe of very ſtrong coffee. This diſcovery, it ſeems, he made after the publication of his book upon that diſeaſe. Since the receipt of that letter, I have frequently directed coffee in the aſthma with great ſucceſs.

COFFER, in *Architecture*, a ſquare depreſſure or ſinking in each interval between the modillions of the Corinthian cornice; ordinarily filled up with a roſe; ſometimes with a pomegranate, or other enrichment.

Coffer, in *Fortification*, denotes a hollow lodgement, athwart a dry moat, from 6 to 7 feet deep, and from 16 to 18 broad; the upper part made of pieces of timber raiſed two feet above the level of the moat, which little elevation has hurdles laden with earth for its covering, and ſerves as a parapet with embraſures; the coffer is nearly the ſame with the caponiere, excepting that this laſt is ſometimes made beyond the counterſcarp on the glacis, and the coffer always in the moat, taking up its whole breadth, which the caponiere does not. It differs from the traverſe and gallery, in that theſe latter are made by the beſiegers, and the coffer by the beſieged. The beſieged generally make uſe of coffers to repulſe the beſiegers when they endeavour to paſs the ditch. To ſave themſelves from the fire of theſe coffers, the beſiegers throw up the earth on that ſide towards the coffer.

COFFERER *of the King's household*, a principal officer in the court, next under the comptroller. He was likewiſe a white-ſtaff officer, and always a member of the privy council. He had a ſpecial charge and overſight of the other officers of the houſehold. He paid the wages of the king's ſervants below ſtairs, and for proviſions as directed by the board of green cloth. This office is now ſuppreſſed, and the buſineſs of it is tranſacted by the lord ſteward, and paymaſter of the houſehold. He had 100l. a-year wages, and 400l. a-year board wages.

COFFIN, the cheſt in which dead bodies are put into the ground.

The ſepulchral honours paid to the manes of departed friends in ancient times, demand attention, and are extremely curious. Their being *put into a coffin* has been particularly conſidered as a mark of the higheſt diſtinction. With us the pooreſt people have their coffins. If the relations cannot afford them, the pariſh is at the expence. On the contrary, in the eaſt they are not at all made uſe of in our times; Turks and Chriſtians, as Thevenot aſſures us, agree in this. The ancient Jews ſeem to have buried their dead in the ſame manner: neither was the body of our Lord, it ſhould ſeem, put into a coffin; nor that of Eliſha, 2 Kings xiii. 21. whoſe bones were touched by the corpſe that was let down *a little after* into his ſepulchre. However, that they were anciently made uſe of in Egypt, all agree; and antique *coffins of ſtone*, and *ſycamore-wood*, are ſtill to be ſeen in that country; not to mention thoſe ſaid to be made of a kind of paſteboard; formed by folding or glueing cloth together a great many times, curiouſly plaſtered, and then painted with hieroglyphics. Its being an ancient Egyptian cuſtom, and not practiſed in the neighbouring countries, were, doubtleſs, the cauſe that the ſacred hiſtorian expreſsly obſerves of Joſeph, that he was not only embalmed, but put into a coffin too*; both being managements peculiar to the Egyptians.

Biſhop Patrick, in his commentary on this paſſage, takes notice of theſe Egyptian coffins of ſycamore wood, and of paſteboard; but he doth not mention the contrary uſage in the neighbouring countries, which was requiſite, one might ſuppoſe, in order fully to illuſtrate the place: but even this perhaps would not have conveyed the whole idea of the ſacred author. Maillet apprehends that all were not incloſed in coffins who were laid in the Egyptian repoſitories of the dead; but that it was an honour appropriated to perſons of figure: for after having given an account of ſeveral riches found in thoſe chambers of death, he adds†, "But it muſt not be imagined that the bodies depoſited in theſe gloomy apartments were *all* incloſed in *cheſts*, and placed in niches. The greateſt part were ſimply embalmed and ſwathed after that manner which every one hath ſome notion of; after which they laid them one by the ſide of another without any ceremony. Some were even laid in theſe tombs without any embalming at all; or ſuch a ſlight one, that there remains nothing of them in the linen in which they were wrapped, but the bones, and thoſe half rotten. It is probable, that each conſiderable family had one of theſe burial-places to themſelves; that the niches were deſigned for the bodies of the heads of the families; and that thoſe of their domeſtics or ſlaves had no other care taken of them than the laying them on the ground, after having been embalmed, or even without that; which, undoubtedly, was alſo all that was done even to the heads of families of leſs diſtinction." After this he gives an account of a way of burial, practiſed anciently in that country, which had been but lately diſcovered, and which conſiſted in placing the bodies, after they were ſwathed, upon a layer of charcoal, and covering them with a mat, under a depth of ſand of ſeven or eight feet.

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* Gen. l. 26.

† Let. vii. p. 181.

That *coffins* then were not univerſally uſed in Egypt, is undoubted from theſe accounts; and probably they were only perſons of diſtinction who were buried in them. It is alſo reaſonable to believe, that in times ſo remote as that of Joſeph, they might be much leſs common than afterwards; and conſequently, that Joſeph's being put in a coffin in Egypt, might be mentioned with a deſign to expreſs the great honours which the Egyptians did him at his death, as well as in life, being interred after the moſt ſumptuous manner of the Egyptians, *embalmed*, and *put into a coffin*. Agreeably to this, the Septuagint verſion, which was made for Egyptians, ſeems to repreſent coffins as a mark of grandeur. Job xxi. 32.

It is no objection to this account, that the widow of Nain's ſon is repreſented as carried forth to be buried in a σορος, or "on a bier:" for the preſent inhabitants of the Levant, who are well known to lay their dead bodies in the earth uninc1oſed, carry them frequently out to burial in a kind of coffin. So Dr Ruſſel, in particular, deſcribes the bier uſed for the Turks at Aleppo, as a kind of coffin much in the form of ours, only that the lid riſes with a ledge in the middle. Chriſtians, indeed, as he tells us, are carried to the grave on an open bier: but as the moſt common kind of bier reſembles our coffins, that uſed by the people of Nain might very poſſibly be of the ſame kind; in which caſe the word σορος was very proper.

COGGLE, or Cog, a ſmall fiſhing-boat upon the coaſts of Yorkſhire: and cogs (*cogones*) are a kind of little ſhips or veſſels uſed in the rivers Ouſe and Humber; (Stat. 23. Hen. VIII. c. 18.) *Præparatis cogonibus, galleis, et aliis navibus, &c.* (Mat. Paris. ann. 1066.) And hence the cogmen, boatmen, and ſeamen, who, after ſhipwreck or loſſes by ſea, travelled and wandered about to defraud the people, by begging and ſtealing, until they were reſtrained by proper laws.

COGITATION, a term uſed by ſome for the act of thinking.

COGNAC, a town of France in Angoumois, with a caſtle, where Francis I. was born. It is ſeated on the river Charante, in a very pleaſant country, abounding in wine, and remarkable for excellent brandy. W. Long. 0. 10. N. Lat. 45. 44.

COGNATE, in *Scots Law*, any male relation by the mother.

COGNATION, in the civil law, a term for that line of conſanguinity which is between males and females, both deſcended from the ſame father; as agnation is for the line of parentage between males only deſcended from the ſame ſtock.

COGNI, an ancient and ſtrong town of Caramania in Turkey in Aſia, and the reſidence of a beglerbeg. It is ſeated in a pleaſant country, abounding in corn, fruits, pulſe, and cattle. Here are ſheep whoſe tails weigh 30 pounds. E. Long. 35. 56. N. Lat. 37. 56.

COGNITIONIS CAUSA, in *Scots Law*. When a creditor charges the heir of his debtor to enter, in order to conſtitute the debt againſt him, and the heir renounces the ſucceſſion, the creditor can obtain no decreet of conſtitution of that debt againſt the heir; but only a decreet ſubjecting the *hæreditas jacens*, or the eſtate which belonged to the debtor, to his diligence: and this is called a decreet *cognitionis cauſa*.

COGNIZANCE, or CONNUSANCE, in *Law*, has divers ſignifications. Sometimes it is an acknowledgment of a fine, or confeſſion of ſomething done; ſometimes the hearing of a matter judicially, as to take cognizance of a cauſe; and ſometimes a particular juriſdiction, as cognizance of pleas is an authority to call a cauſe or plea out of another court, which no perſon can do but the king, except he can ſhow a charter for it. This cognizance is a privilege granted to a city or a town to hold plea of all contracts, &c. within the liberty; and if any one is impleaded for ſuch matters in the courts at Weſtminſter, the mayor, &c. of ſuch franchiſe may demand cognizance of the plea, and that it may be determined before them.

COGNIZANCE is alſo uſed for a badge on a waterman's or ſerving-man's ſleeve, which is commonly the giver's creſt, whereby he is decerned to belong to this or that nobleman or gentleman.

COGGS. See COGGLE.

COHABITATION, denotes the ſtate of a man and a woman who live together without being legally married. By the common law of Scotland, cohabitation for year and day, or a complete twelvemonth, is deemed equivalent to matrimony.

CO-HEIR, one who ſucceeds to a ſhare of an inheritance, to be divided among ſeveral.

COHESION, one of the four ſpecies of attraction, denoting that force by which the parts of bodies adhere or ſtick together.

1
Conſidered by Sir Iſaac Newton as an eſſential property of matter.

This power was firſt conſidered by Sir Iſaac Newton as one of the properties eſſential to all matter, and the cauſe of all that variety we obſerve in the texture of different terreſtrial bodies. He did not, however, abſolutely determine that the power of coheſion was an immaterial one; but thought it might poſſibly ariſe, as well as that of gravitation, from the action of an ether. His account of the original conſtitution of matter is as follows: It ſeems probable, that God in the beginning formed *matter* in ſolid, maſſy, impenetrable, moveable particles; of ſuch ſizes, figures, and other properties, and in ſuch proportion to ſpace, as moſt conduced to the end for which he formed them; and

2
His account of the original conſtitution of matter.

that theſe primitive particles being ſolid, are incomparably harder than any porous bodies compoſed of them; even ſo very hard as never to wear or break in pieces; no ordinary power being able to divide what God himſelf made one at the firſt creation. While the particles continue entire, they may compoſe bodies of one and the ſame nature and texture in all ages; but ſhould they wear away, or break in pieces, the nature of all things depending on them would be changed. Water and earth compoſed of old worn particles and fragments of particles, would not now be of the ſame texture with water and earth compoſed of entire particles in the beginning. And therefore, that nature may be laſting, the changes of corporeal things are to be placed in the various ſeparations and new aſſociations and motions of theſe permanent particles; compound bodies being apt to break, not in the midſt of ſolid particles, but where theſe particles are laid together, and touch in a few points." It ſeems farther, "That theſe particles have not only a *vis inertiæ*, accompanied with ſuch paſſive laws of motion as naturally reſult from that force; but alſo that they are moved by certain active principles, ſuch as that of gravity, and that which cauſeth fermentation and the coheſion of bodies. Theſe principles are to be conſidered not as occult qualities, ſuppoſed to reſult from the ſpecific forms of things, but as general laws of nature by which the things themſelves are formed; their truth appearing to us by phenomena, though their cauſe is not yet diſcovered."

3
Attraction the general law of nature.

The general law of nature, by which all the different bodies in the univerſe are compoſed, according to Sir Iſaac Newton, is that of attraction: i. e. "Every particle of matter has an attractive force, or a tendency to every other particle; which power is ſtrongeſt in the point of contact, and ſuddenly decreaſes, inſomuch that it acts no more at the leaſt ſenſible diſtance; and at a greater diſtance is converted into a repellent force, whereby the parts fly from each other. On this principle of attraction may we account for the coheſion of bodies, otherwiſe inexplicable.

4
Formation of particles of different ſizes.

"The ſmalleſt particles may cohere by the ſtrongeſt attractions, and compoſe bigger particles of weaker virtue; and many of theſe may cohere, and compoſe bigger particles, whoſe virtue is ſtill leſs; and ſo on for divers ſucceſſions, until the progreſſion end in the biggeſt particles, on which the operations in chemiſtry, and the colours of natural bodies, depend; and which, by cohering, compoſe bodies of a ſenſible magnitude.

5
Diſtinction of bodies into hard, ſoft, humid, &c.

If the body is compact, and bends or yields inward to preſſure without any ſliding of its parts, it is hard and elaſtic, returning to its figure with a force ariſing from the mutual attraction of its parts. If the parts ſlide from one another, the body is malleable or ſoft. If they ſlip eaſily, and are of a fit ſize to be agitated by heat, and the heat is great enough to keep them in agitation, the body is fluid: and if it be apt to ſtick to things, it is humid; and the drops of every fluid affect a round figure by the mutual attractions of their parts, as the globe of the earth and ſea affects a round figure from the mutual attraction and gravity of its parts.

"Since metals diſſolved in acids attract but a ſmall quantity of the acid, their attractive force reaches but to a ſmall diſtance. Now, as in algebra, where affirmative quantities ceaſe, there negative ones begin; ſo in mechanics, where attraction ceaſes, there a repulſive virtue muſt ſucceed. That there really is ſuch a virtue ſeems to follow from the reflections and inflections of the rays of light; the rays being repelled by bodies in both theſe caſes without the immediate contact of the reflecting or inflecting body. The ſame thing ſeems alſo to follow from the emiſſion of light; a ray, as ſoon as ſhaken off from a body by the vibrating motion of the parts of the body, and got beyond the reach of attraction, being driven away with exceeding great velocity; for that force which is ſufficient to turn it back in reflection may be ſufficient to emit it. From the ſame repelling power it ſeems to be that flies walk upon the water without wetting their feet; that the object-glaſſes of long teleſcopes lie upon one another without touching; and that dry powders are difficultly made to touch one another ſo as to ſtick together, without melting them or wetting them with water, which, by exhaling, may bring them together.

6
Exiſtence of repulſive power proved.

"The particles of all hard homogeneous bodies which touch one another, cohere with a great force; to account for which, ſome philoſophers have recourſe to a kind of hooked atoms, which in effect is nothing elſe but to beg the queſtion. Others imagine, that the particles of bodies are connected by reſt, i. e. in effect by nothing at all; and others, by conſpiring motions, i. e. by a relative reſt among themſelves. For myſelf, it rather appears to me, that the particles of bodies cohere by an attractive force, whereby they tend mutually to each other."

7
No concluſion to be drawn from this account.

From this account of the formation and conſtitution of bodies, we can conclude nothing, except that they are compoſed of an infinite number of little particles, kept together by a force or power; but of what nature that power is, whether material or immaterial, we muſt remain ignorant till farther experiments are made. Some of the Newtonian philoſophers, however, have poſitively determined theſe powers to be immaterial. In conſequence of this ſuppoſition, they have ſo refined upon attractions and repulſions, that their ſyſtems ſeem not far from downright ſcepticiſm, or denying the exiſtence of matter altogether. A ſyſtem of this kind we find adopted by Dr Prieſtley*, from Meſſrs Boſcovich and Michell, in order to ſolve ſome difficulties concerning the Newtonian doctrine of light. "The eaſieſt method (ſays he) of ſolving all difficulties, is to adopt the hypotheſis of Mr Boſcovich, who ſuppoſes that matter is not impenetrable, as has been perhaps univerſally taken for granted; but that it conſiſts of phyſical points only, endued with powers of attraction and repulſion in the ſame manner as ſolid matter is generally ſuppoſed to be: provided therefore that any body moves with a ſufficient degree of velocity, or has a ſufficient *momentum* to overcome any powers of repulſion that it may meet with, it will find no difficulty in making its way through any body whatever; for nothing elſe will penetrate one another but powers, ſuch as we know do in fact exiſt in the ſame place, and counterbalance or overrule one another. The moſt obvious difficulty, and indeed almoſt the only one that attends this hypotheſis, as it ſuppoſes the mutual penetrability of matter, ariſes from the idea

8
Mr Michell's hypotheſis adopted by Dr Prieſtley.

* *Hiſt. of Viſion*, vol. p. 392.

9 Bodies oppoſe each other not from actual contact.

idea of the nature of matter, and the difficulty we meet with in attempting to force two bodies into the ſame ſpace. But it is demonſtrable that the firſt obſtruction ariſes from no actual contact of matter, but from mere powers of repulſion. The difficulty we can overcome: and having got within one ſphere of repulſion, we fancy that we are now impeded by the ſolid matter itſelf. But the very ſame is the opinion of the generality of mankind with reſpect to the firſt obſtruction. Why, therefore, may not the next be only another ſphere of repulſion, which may only require a greater force than we can apply to overcome it, without diſordering the arrangement of the conſtituent particles; but which may be overcome by a body moving with the amazing velocity of light.

10 Mr Baxter's opinion.

"This ſcheme of the *immateriality of matter* as it may be called, or rather the *mutual penetration of matter*, firſt occurred to Mr Michell on reading *Baxter on the immateriality of the ſoul.* He found that this author's idea of matter was, that it conſiſted, as it were of bricks cemented together with immaterial mortar. Theſe bricks, if he would be conſiſtent with his own reaſoning, were again compoſed of leſs bricks, cemented likewiſe by an immaterial mortar; and ſo on *ad infinitum.* This putting Mr Michell upon the conſideration of the ſeveral appearances of nature, he began to perceive that the bricks were ſo covered with this immaterial mortar, that if they had any exiſtence at all, it could not poſſibly be perceived; every effect being produced, in nine inſtances of ten certainly, and probably in the tenth alſo, by this immaterial, ſpiritual, and penetrable mortar. Inſtead therefore of placing the world upon the giant, the giant upon the tortoiſe, and the tortoiſe upon, he could not tell what, he placed the world at once upon itſelf."

11 Coheſion ſuppoſed owing to elementary fire.

Other philoſophers have ſuppoſed the powers both of gravitation and coheſion to be material; and to be only different actions of the ethereal fluid, or elementary fire. In ſupport of this it has been urged, that before we have recourſe to a ſpiritual and immaterial power as the cauſe of any natural phenomenon, we ought to be well aſſured that there is no material ſubſtance with which we are acquainted, that is capable of producing ſuch effects. In the preſent caſe, we are ſo far from having ſuch aſſurance, that the contrary is manifeſt to our ſenſes. One inſtance of this is in the experiment with the *Magdeburg hemiſpheres*, as they are called. Theſe are two hollow hemiſpheres of braſs, exactly fitted to one another, ſo as to form one globe when joined together, without admitting any air at the joining. In this ſtate, if the air within them is exhauſted by means of a pump, they will cohere with ſuch force, if they are five or ſix inches diameter, as to require a weight of ſome hundreds of pounds to ſeparate them. The preſſure of the atmoſphere, we ſee, is in this caſe capable of producing a very ſtrong coheſion; and if there is in nature any fluid more penetrating, as well as more powerful in its effects, than the air we breathe, it is poſſible that what is called the *attraction of coheſion* may ſome how or other be an effect of the action of that fluid. Such a fluid as this is the element of fire. Its activity is ſuch as to penetrate all bodies whatever; and in the ſtate in which it is commonly called *fire*, it acts according to the quantity of ſolid matter contained in the body. In this ſtate, it is capable of diſſolving the ſtrongeſt coheſions obſerved in nature; but whatever is capable of diſſolving any coheſion, muſt neceſſarily be endued with greater power than that by which the coheſion is cauſed. Fire, therefore, being able to diſſolve coheſions, muſt alſo be capable of cauſing them, provided its power is exerted for that purpoſe. Nor will it ſeem at all ſtrange that this fluid ſhould act in two ſuch oppoſite ways, when we conſider the different appearances which it aſſumes. Theſe are three, viz. fire or heat, in which it conſumes, deſtroys, and diſſolves: light, in which it ſeems deprived of all deſtructive or diſſolvent power, and to be the moſt mild, quiet, and placid being in nature. The third ſtate of this element is, when it becomes what is called the *electric fluid*; and then it attracts, repels, and moves bodies, in a vaſt variety of ways, without either burning or rendering them viſible by its light. In this ſtate it is not leſs powerful than in either of the other two; for a violent ſhock of electricity will diſplace and tear in pieces the moſt heavy and ſolid bodies. The ſeeming capricious nature of this fluid, however, probably renders it leſs ſuſpected as the cauſe of coheſion, than it otherwiſe would be, were the attractions regular and permanent, which we obſerve it to occaſion. But here we muſt obſerve, that the fluid has an exiſtence in all bodies before the experiments are tried which make its effects viſible to us, and is acting in them according to its ſettled and eſtabliſhed laws. While acting in this manner it is perfectly inviſible; and all we can do is, to produce ſome little infringement of theſe regular laws according to which it commonly acts. In ſome caſes, however, the electrical attractions produced by art are found to be pretty permanent and ſtrong. Thus, Mr Symmer, in ſome experiments with ſilk ſtockings, found their attraction ſo ſtrong, that it required upwards of 15 pounds weight to ſeparate them from each other; and this attraction would continue for more than an hour. In plates of glaſs, too, he obſerved a remarkable coheſion when electrified. In the Philoſophical Tranſactions for 1777, we find this hypotheſis taken notice of, and in ſome meaſure adopted, by Mr Henley. "Some gentlemen (ſays he) have ſuppoſed that the electric matter is the cauſe of the coheſion of the particles of bodies. If the electric matter be, as I ſuſpect, a real elementary fire inherent in all bodies, that opinion may probably be well founded; and perhaps the ſoldering of metals, and the cementation of iron, by fire, may be conſidered as ſtrong proofs of the truth of their hypotheſis."

On this laſt hypotheſis we muſt obſerve, that if the electric, or any other fluid, is ſuppoſed to be the cauſe of the attraction of coheſion univerſally, the particles of that fluid muſt be deſtitute of all coheſion between themſelves; otherwiſe we ſhould be at as great a loſs to account for the coheſion of theſe particles, as for that of terreſtrial matter. Philoſophers, indeed, do not ſuppoſe any coheſion between the particles of the electric fluid themſelves; it is generally believed that the particles of this fluid are repulſive of one another, though attracted by all other matter. If this is a fact, we cannot ſuppoſe the electric fluid to be the cauſe of coheſion. The probability or improbability of the hypotheſis, juſt mentioned, muſt greatly depend on its being

ing aſcertained whether the particles of the electric fluid do really repel one another, and attract all other kinds of matter, or not; but for this we muſt refer to the article ELECTRICITY.

COHOBATION, in *Chemiſtry*, an operation by which the ſame liquor is frequently diſtilled from the ſame body, either with an intention to diſſolve this body, or to produce ſome change upon it. This is one of thoſe operations which the ancient chemiſts practiſed with great patience and zeal, but which is now neglected. To make the operation eaſier, and to prevent the trouble of frequently changing the veſſels, a particular kind of alembic, called a *pelican*, was invented. This veſſel was made in the form of a cucurbit with an alembic-head, but had two ſpouts communicating with the body. As the vapour roſe up into the head, it was gradually condenſed, and ran down the ſpouts into the body of the pelican from whence it was again diſtilled; and ſo on,

COHORN (N.) the greateſt engineer Holland has produced. Among his other works, which are eſteemed maſterpieces of ſkill, he fortified Bergen-op-zoom; which, to the ſupriſe of all Europe, was taken by the French in 1747; but that, it is believed, was the effect of treachery. He wrote a treatiſe on fortification, and died in 1704.

COHORT, in Roman antiquity, the name of part of the Roman legion, comprehending about 600 men. There were ten cohorts in a legion, the firſt of which exceeded all the reſt both in dignity and number of men. When the army was ranged in order of battle, the firſt cohort took up the right of the firſt line; the reſt followed in their natural order; ſo that the third was in the centre of the firſt line of the legion, and the fifth on the left; the ſecond between the firſt and third; and the fourth between the third and fifth: the five remaining cohorts formed a ſecond line in their natural order.

COIF, the badge of a ſergeant at law, who is called ſergeant of the coif, from the lawn coif they wear under their caps when they are created ſergeants.

The chief uſe of the coif was to cover the clerical tonſure. See TONSURE.

COILING, on ſhipboard, implies a ſort of ſerpentine winding of a cable or other rope, that it may occupy a ſmall ſpace in the ſhip. Each of the windings of this ſort is called a *fake;* and one range of fakes upon the ſame line is called a *tier*. There are generally from five to ſeven fakes in a tier; and three or four tiers in the whole length of the cable. This however, depends on the extent of the fakes. The ſmaller ropes employed about the ſails are coiled upon cleats at ſea, to prevent their being entangled amongſt one another in traverſing, contracting, or extending the ſails.

COILON, in the ancient Grecian theatres, the ſame with the cavea of the Romans.

COIMBRA, a handſome, large, and celebrated town of Portugal, capital of the province of Beira, with a biſhop's ſee, and a famous univerſity. The cathedral and the fountains are very magnificent. It is ſeated in a very pleaſant country abounding in vineyards, olive-trees, and fruits. It ſtands on a mountain, by the ſide of the river Mondego. W. Long. 8. 17. N. Lat. 40. 12.

COIN, a piece of metal converted into money by the impreſſion of certain marks or figures thereon.

COIN differs from MONEY as the ſpecies from the genus. Money is any matter, whether metal, wood, leather, glaſs, horn, paper, fruits, ſhells, or kernels, which have currency as a medium in COMMERCE. Coin is a particular ſpecies, always made of metal, and ſtruck according to a certain proceſs called COINING.

The preciſe epocha of the invention of money is too ancient for our annals; and, if we might argue from the neceſſity and obviouſneſs of the thing, muſt be nearly coeval with the world.

Whether coins be of equal antiquity, may admit of ſome doubt; eſpecially as moſt of the ancient writers are ſo frequent and expreſs in their mention of leathern-moneys, paper-moneys, wooden-moneys, &c. Some, however, notwithſtanding this, are of opinion, that the firſt moneys were of metal: the reaſons they give, are the firmneſs, neatneſs, cleanneſs, durableneſs, and univerſality of metals; which, however, do rather conclude they ought to have been ſo, than that they actually were ſo.

In effect, the very commodities themſelves were the firſt moneys, i. e. were current for one another by way of exchange; and it was the difficulty of cutting or dividing certain commodities, and the impoſſibility of doing it without great loſs, that firſt put men on the expedient of a general medium. See EXCHANGE.

Indeed, thus much may be ſaid in behalf of coins, that, on this view, it was natural for men to have their firſt recourſe to metals, as being almoſt the only things whoſe goodneſs, and as it were integrity, is not diminiſhed by partition; beſides the advantages above expreſſed, and the conveniences of melting and returning them into a maſs of any ſize or weight.

It was probably, then, this property of metals which firſt accuſtomed people, who traded together, to account them in lieu of quantities of other merchandiſes in their exchanges, and at length to ſubſtitute them wholly in their ſtead; and thus aroſe money; as it was their other property to preſerve any mark or impreſſion a long time, which confirmed them in the right; and thus was the firſt riſe of coins.

In the firſt ages, each perſon cut his metal into pieces of different ſizes and forms, according to the quantity to be given for any merchandiſe, or according to the demand of the ſeller, or the quantity ſtipulated between them. To this end they went to market loaded with metal in proportion to the purchaſe to be made, and furniſhed with inſtruments for portioning it, and ſcales for dealing it out, according as occaſion required. By degrees, it was found more commodious to have pieces ready weighed; and as there were different weights required according to the value of the different wares, all thoſe of the ſame weight began to be diſtinguiſhed with the ſame mark or figure: thus were coins carried one ſtep further. At length the growing commerce of money beginning to be diſturbed with frauds, both in the weights and the matter, the public authority interpoſed; and hence the firſt ſtamps or impreſſions of money; to which ſucceeded ed the names of the moniers; and at length the effigy of the prince, the date, legend, and other precautions to prevent the alterations of the ſpecies; and thus were coins completed.

Modern Coins. In England the current ſpecies of gold are the guinea, half-guinea, ſeven-ſhillings piece, Jacobus, laureat, angel, and roſe-noble; the four laſt of which are now ſeldom to be met with; having been moſt of them converted into guineas, chiefly during the reign of Charles II. and James II. The ſilver coins are the crown, half-crown, ſhilling, and ſixpence. Copper coins are the farthing, half-penny, penny and two-penny pieces.

In Scotland, by the articles of the Union, it is appointed that all the coins be reduced to the Engliſh, and the ſame accounts obſerved throughout. Till then the Scots had their pounds, ſhillings, and pence, as in England; but their pound was but 20 pence Engliſh, and the others in proportion: accordingly, their merk was $13\frac{1}{3}$s. Scots, current in England at $13\frac{1}{2}$d.; their noble in proportion. Beſides theſe they had their turnorer-pence and half-pence; their penny $\frac{1}{12}$ of that of England: beſides baſe money of achiſons, babees, and placks. The bodle $\frac{1}{6}$ of the penny, $\frac{1}{4}$ of the achiſon, $\frac{1}{3}$ of the babee, and $\frac{1}{2}$ of the plack.

In Ireland, the coins are as in England, viz. ſhillings, pence, &c. with this difference, that their ſhilling is but equal to $11\frac{3}{400}$d. ſterling: whence their pound is only 18s. $5\frac{1}{4}$d.

But, for a view of all the coins preſently current in the four quarters of the globe, with their values and proportions, ſee the table ſubjoined to the article Money.

In many places ſhells are current for coins; particularly a ſmall white kind dug out of the ground in the Maldives, and ſome parts of America, called in the Indies *cowries*, or *coris*, on the coaſt of Africa *bonges*, and in America *porcelaines;* of which it takes a vaſt number to be equivalent in value to a penny. Of zimbis, another kind of ſhell current, particularly in the kingdoms of Angolo and Congo, two thouſand make what the negroes call a *macoute*, which is no real money; for of this there is none in this part of Africa, but a manner of reckoning: thus, two Flemiſh knives they eſteem a macoute; a copper baſon two pounds weight, and 12 inches diameter, they reckon three macoutes; a fuſee 10, &c.

In ſome places fruits are current for coins. Of theſe there are three ſorts uſed; two in America, particularly among the Mexicans, which are the cacao and maize; the other in the Eaſt Indies, viz. almonds brought thither from Lar, and growing in the deſerts of Arabia. Of cacao 15 are eſteemed equivalent to a Spaniſh rial, or ſeven pence ſterling. Maize has ceaſed to be a common money ſince the diſcovery of America by the Europeans. Almonds are chiefly uſed where the *cowries* are not current. As the year proves more or leſs favourable to this fruit, the value of the money is higher or lower. In a common year 40 almoſt are ſet againſt a *peſcba*, or halfpenny ſterling; which brings each almond to $\frac{1}{20}$ of a farthing.

Ancient Coins are thoſe chiefly which have been current among the Jews, Greeks and Romans. Their values and proportions are as follow;

JEWISH.

					ſterl. *l.*	*s.*	*d.*
				Gerah	0	0	$1\frac{57}{100}$
10				Becah	0	0	$1\frac{11}{16}$
20	2			Shekel	0	0	$2\frac{3}{8}$
1200	120	50		Maneh Mina hebraica	5	14	$0\frac{3}{4}$
60000	6000	3000	60	Talent	342	3	9
				Solidus aureus, or ſextula, worth	0	12	$0\frac{1}{2}$
				Siculus aureus, worth	1	16	6
				A talent of gold, worth	5475	0	0

GRECIAN.

											ſter. *s.*	*d.*	*qrs.*
										Lepton	0	0	$0\frac{31}{336}$
7										Chalcus	0	0	$0\frac{31}{48}$
14	2									Dichalcus	0	0	$1\frac{7}{24}$
28	4									Hemiobolum	0	0	$2\frac{1}{12}$
56	8	4	2							Obolus	0	1	$1\frac{1}{6}$
112	16	8	4	2						Diobolum	0	2	$2\frac{1}{3}$
224	32	16	8	4	2					Tetrobolum	0	5	$0\frac{2}{3}$
336	48	24	12	6	3	$1\frac{1}{2}$				Drachma	0	7	3
662	96	48	24	12	6	3	2			Didrachmon	1	3	2
1324	112	96	48	24	12	6	4	2		Tetrardſtat.	2	7	0
1660	384	120	60	30	15	$7\frac{1}{2}$	5	$2\frac{1}{2}$	$1\frac{1}{4}$	Pentrad.	3	2	3

Note: Of theſe the drachma, didrachma, &c. were of ſilver, the reſt for the moſt part of braſs. The other parts, as tridrachm, tribolus, &c. were ſometimes coined.

Note alſo: The drachma is here, with the generality of authors, ſuppoſed equal to the denarius; though there is reaſon to believe that the drachma was ſomewhat the weightier. See Drachma and Denarius.

	ſter. *l.*	*s.*	*d.*
The Grecian gold coin was the ſtater aureus, weighing two Attic drachms, or half of the ſtater argenteus, and exchanging uſually for 25 Attic drachms of ſilver in our money.	0	16	$1\frac{3}{4}$
According to our proportion of gold to ſilver	1	0	9
There were likewiſe the ſtater cyzicenus, exchanging for 28 attic drachms, or	0	18	1
Stater Philippicus, and ſtater Alexandrinus, of the ſame value.			
Stater daricus, according to Joſephus, worth 50 attic drachms, or	1	12	$3\frac{1}{2}$
Stater crœſius, of the ſame value.			

ROMAN.

						ſter. *s.*	*d.*	*qrs.*
					Teruncius	0	0	$0\frac{775}{1000}$
2					Semilibella	0	0	$1\frac{55}{100}$
4	2				Libella As	0	0	$3\frac{1}{10}$
10	5	$2\frac{1}{2}$			Seſtertius	0	1	$3\frac{3}{4}$
20	10	5	2		Quinarius Victoriatus	0	3	$3\frac{1}{2}$
40	20	10	4		Denarius	0	7	3

Note: Of theſe the denarius, victoriatus, ſeſtertius, and ſometimes the as, were of ſilver, the reſt of braſs. See As, &c.

There were ſometimes alſo coined of braſs the triens, ſextans, uncia, ſextula, and dupondius.

	l.	*s.*	*d.*
The Roman gold coin was the aureus, which weighed generally double the denarius; the value of which according to the firſt proportion of coinage, mentioned by Pliny, was	1	4	3¾
According to the proportion that obtains now amongſt us, worth	1	0	9
According to the decuple proportion, mentioned by Livy and Julius Pollux, worth	0	12	11
According to the proportion mentioned by Tacitus, and which afterwards obtained, whereby the aureus exchanged for 25 denarii, its value.	0	16	1¾

Coin, in *Architecture*, a kind of dye cut diagonally, after the manner of a flight of a ſtaircaſe, ſerving at bottom to ſupport columns in a level, and at top to correct the inclination of an entablature ſupporting a vault.

Coin is alſo uſed for a ſolid angle compoſed of two ſurfaces inclined towards each other, whether that angle be exterior, as the coin of a wall, a tree, &c. or interior, as the coin of a chamber or chimney. See Quoin.

COINAGE, or Coining, the art of making money, as performed either by the hammer or mill.

Formerly the fabric of coins was different from what it is at preſent. They cut a large plate of metal into ſeveral little ſquares, the corners of which were cut off with ſciſſars. After having ſhaped theſe pieces, ſo as to render them perfectly conformable, in point of weight, to the ſtandard piece, they took each piece in hand again, to make it exactly round by a gentle hammering. This was called a *planchet*, and was fit for immediate coining. Then engravers prepared, as they ſtill do, a couple of ſteel maſſes in form of dyes, cut and terminated by a flat ſurface, rounded off at the edges. They engraved or ſtamped on it the hollow of a head, a croſs, a ſcutcheon, or any other figure, according to the cuſtom of the times, with a ſhort legend. As one of theſe dyes was to remain dormant, and the other moveable, the former ended in a ſquare priſm, that it might be introduced into the ſquare hole of the block, which, being fixed very faſt, kept the dye as ſteady as any vice could have done. The planchet of metal was horizontally laid upon this inferior maſs, to receive the ſtamp of it on one ſide, and that of the upper dye, wherewith it was covered, on the other. This moveable dye, having its round engraved ſurface reſting upon the planchet, had at its oppoſite extremity a flat ſquare, and larger ſurface, upon which they gave ſeveral heavy blows, with a hammer of an enormous ſize, till the double ſtamp was ſufficiently, in relievo, impreſſed on each ſide of the planchet. This being finiſhed, was immediately ſucceeded by another, and they thus became a ſtandard coin, which had the degree of fineneſs of the weight and mark determined by the judgment of the inſpectors, to make it good current money; the ſtrong tempering which was and is ſtill given to the two dyes, rendering them capable of bearing thoſe repeated blows. Coining has been conſiderably improved and rendered expeditious, by ſeveral ingenious machines, and by a wiſe application of the ſureſt phyſical experiments to the methods of fining, dyeing, and ſtamping the different metals.

The three fineſt inſtruments the mint-man uſes, are the laminating engine; the machine for making the impreſſions on the edges of coins; and the mill.

After they have taken the laminæ, or plates of metal, out of the mould into which they are caſt, they do not beat them on the anvil, as was formerly done, but make them paſs and repaſs between the ſeveral rollers of the laminating engine, which being gradually brought cloſer and cloſer to each other, preſently give the lamina its uniform and exact thickneſs. Inſtead of dividing the lamina into ſmall ſquares, they at once cut clean out of it as many planchets as it can contain, by means of a ſharp ſteel trepan, of a roundiſh figure, hollow within, and of a proportionable diameter, to ſhape and cut off the piece at one and the ſame time. After thoſe planchets have been prepared and weighed with ſtandard pieces, filed or ſcraped, to get off the ſuperfluous part of the metal, and then boiled and made clean, they arrive, at laſt, at the machine (fig. 1.), which marks them upon the edge; and finally, the mill (fig. 2.), which, ſqueezing each of them ſingly between the two dyes, brought near each other with one blow, forces the two ſurfaces or fields of the piece to fill exactly all the vacancies of the two figures engraved hollow. The engine which ſerves to laminate lead, gives a ſufficient notion of that which ſerves to flatten gold and ſilver laminæ between rollers of a leſſer ſize.

Plate CL.

The principal pieces of the machine (fig. 1.), to ſtamp coins on the edge, are two ſteel laminæ, about a line thick. One half of the legend, or of the ring, is engraved on the thickneſs of one of the laminæ, and the other half on the thickneſs of the other; and theſe two laminæ are ſtraight, although the planchet marked with them be circular.

When they ſtamp a planchet, they firſt put it between the laminæ in ſuch a manner, as that theſe being each of them laid flat upon a copperplate, which is faſtened upon a very thick wooden table, and the planchet being likewiſe laid flat upon the ſame plate, the edge of the planchet may touch the two laminæ on each ſide, and in their thick part.

One of theſe laminæ is immoveable, and faſtened with ſeveral ſcrews; the other ſlides by means of a dented wheel, which takes into the teeth that are on the ſurface of the lamina. This ſliding lamina makes the planchet turn in ſuch a manner, that it remains ſtamped on the edge, when it has made one turn. Only crown and half-crown pieces can bear the impreſſion of letters on the thickneſs of their edges.

The coining engine or mill is ſo fitted for diſpatch, (fig. 2.), that a ſingle man may ſtamp 20,000 planchets in one day: gold, ſilver, and copper planchets, are all of them coined with a mill, to which the coining ſquares (fig. 3.), commonly called dyes are faſtened; that of the face under, in a ſquare box furniſhed with male and female ſcrews, to fix and keep it ſteady; and the other above, in a little box garniſhed with the ſame ſcrews, to faſten the coining ſquare. The planchet is laid flat on the ſquare of the effigy, which is dormant; and they immediately pull the bar of the mill by its cords, which cauſes the ſcrew ſet within it to turn. This enters into the female ſcrew, which is in the body of the mill, and turns with ſo much ſtrength, that by pulling the upper ſquare upon that of the effigy, the planchet, violently preſſed between both ſquares, receives the impreſſion of both at one pull, and in the twinkling of an eye.

The planchet thus ſtampt and coined, goes through a final examination of the mint wardens, from whoſe hands it goes into the world.

In the Coining *of Medals*, the proceſs is the ſame in effect with that of money, the principal difference conſiſting in this, that money having but a ſmall relievo, receives its impreſſion at a ſingle ſtroke of the engine; whereas for medals, the height of their relievo makes it neceſſary that the ſtroke be repeated ſeveral times: to this end the piece is taken out from between the dyes, heated, and returned again; which proceſs, in medallions and large medals, is repeated 15 or 20 times before the full impreſſion be given: care muſt be taken, every time the planchet is removed, to take off the ſuperfluous metal ſtretched beyond the circumference with a file. Medallions, and medals of a high relievo, are uſually firſt caſt in ſand, by reaſon of the difficulty of ſtamping them in the preſs, where they are put only to perfect them; in regard the ſand does not leave them clear, ſmooth, and accurate enough. Therefore we may ſee that medals receive their form and impreſſion by degrees, whereas money receives them all at once.

Britiſh Coinage, both by the beauty of the engraving, and by the invention of the impreſſions on the edges, that admirable expedient for preventing the alteration of the ſpecies, is carried to the utmoſt perfection.

It was only in the reign of King William III. that the hammer-money ceaſed to be current in England, where till then it was ſtruck in that manner, as in other nations. Before the hammer ſpecie was called in, the Engliſh money was in a wretched condition, having been filed and clipped by natives as well as foreigners, inſomuch that it was ſcarce left of half the value: the retrieving this diſtreſſed ſtate of the Engliſh money is looked upon as one of the glories of King William's reign.

The Britiſh coinage is now wholly performed in the Tower of London, where there is a corporation for it, under the title of the *mint*. Formerly there were here, as there are ſtill in other countries, the rights of ſeinorage and braſſage; but ſince the eighteenth year of King Charles II. there is nothing taken either for the king or for the expences of coining; ſo that weight is returned for weight to any perſon who carries their gold and ſilver to the Tower.

The ſpecies coined in Great Britain are eſteemed contraband goods, and not to be exported. All foreign ſpecies are allowed to be ſent out of the realm, as well as gold and ſilver in bars, ingots, duſt, &c.

Barbary Coinage, particularly that of Fez and Tunis, is under no proper regulation, as every goldſmith, Jew, or even private perſon, undertakes it at pleaſure; which practice renders their money exceedingly bad, and their commerce very unſafe.

Muſcovite Coinage. In Muſcovy there is no other coin ſtruck but ſilver, and that only in the cities of Moſcow, Novogorod, Twere, and Pleſkow, to which may be added Peterſburgh. The coinage of each of theſe cities is let out to farm, and makes part of the royal revenue.

Perſian Coinage. All the money made in Perſia is ſtruck with a hammer, as is that of the reſt of Aſia; and the ſame may be underſtood of America, and the coaſts of Africa, and even Muſcovy: the king's duty, in Perſia, is ſeven and a half per cent. for all the moneys coined, which are lately reduced to ſilver and copper, there being no gold coin there except a kind of medals, at the acceſſion of a new ſophi.

Spaniſh Coinage is eſteemed one of the leaſt perfect in Europe. It is ſettled at Seville and Segovia, the only cities where gold and ſilver are ſtruck.

COIRE, or, as the Germans call it, Chur, a large and handſome town of Switzerland, and capital of the country of the Griſons, with a biſhop's ſee whoſe prelate has the right of coining money. It is divided into two parts; the leaſt of which is of the Roman Catholic religion, and the greateſt of the Poteſtant. It is governed by its own laws, and ſeated in a plain, abounding in vineyards and game, on the river Pleſſure, half a mile from the Rhine. E. Long. 9. 25. N. Lat. 46. 50.

COITION, the intercourſe between male and female in the act of generation.

It is obſerved that frogs are forty days in the act of coition. Bartholine, &c. relate, that butterflies make 130 vibrations of the wings in one act of coition.

COIX, job's-tears. See Botany *Index*. In Spain and Portugal the poor people grind the ſeeds of this plant in times of ſcarcity, and make a coarſe kind of bread of them. The ſeeds are incloſed in ſmall capſules about the bigneſs of an Engliſh pea, and of different colours. Theſe are ſtrung upon ſilk, and uſed inſtead of bracelets by ſome of the poorer ſort in the Weſt Indies, but eſpecially by the negroes.

COKE, or Cooke, Sir Edward, lord chief juſtice of the king's bench in the reign of James I. was deſcended from an ancient family in Norfolk and born at Milcham in 1549. When he was a ſtudent in the Inner-Temple, the firſt occaſion of his diſtinguiſhing himſelf was the ſtating the caſe of a cook belonging to the Temple ſo exactly, that all the houſe, who were puzzled with it, admired him and his pleading, and the whole bench took notice of him. After his marriage with a lady of great fortune, preferments flowed in upon him. The cities of Norwich and Coventry choſe him for their recorder; the county of Norfolk, for one of their knights in parliament; and the houſe of commons, for their ſpeaker, in the 35th year of Queen Elizabeth. The queen appointed him ſolicitor-general in 1592, and attorney-general the next year. In 1603, he was knighted by King James I.; and in November the ſame year, upon the trial of Sir Walter Raleigh, &c. at Wincheſter, he treated that gentleman with a ſcurrility of language hardly to be paralleled. June 27. he was appointed lord chief juſtice of the common pleas; and in 1613, lord chief juſtice of the king's bench, and ſworn one of the privy council. In 1615, he was very vigorous in the diſcovery and proſecution of the perſons employed in poiſoning

Sir Thomas Overbury in the Tower in 1612. His conteſt not long after with the lord chancellor Egerton, with ſome other caſes, haſtened the ruin of his intereſt at court; ſo that he was ſequeſtrated from the council-table and the office of lord chief juſtice. In 1621, he vigorouſly maintained in the houſe of commons, that no proclamation is of any force againſt the parliament. The ſame year, being looked upon as one of the great incendiaries in the houſe of commons, he was removed from the council of ſtate with diſgrace; the king ſaying, that "he was the fitteſt inſtrument for a tyrant that ever was in England:" he was alſo committed to the Tower, and his papers were ſeized. Upon the calling of a new parliament in 1625, the court-party, to prevent his being elected a member, got him appointed ſheriff of Buckinghamſhire; to avoid the office, if poſſible, he drew up exceptions againſt the oath of a ſheriff, but was obliged to undertake the office. In 1628 he ſpoke vigorouſly upon grievances, and made a ſpeech, in which he affirmed, that "the duke of Buckingham was the cauſe of all our miſeries." While he lay upon his deathbed, his papers and laſt will were ſeized by an order of council. He died in 1634, and publiſhed many works: the moſt remarkable are his Inſtitutes of the laws of England; the firſt part of which is only a tranſlation and comment of Sir Thomas Littleton, one of the chief juſtices of the common pleas in the reign of Edward IV.

COKENHAUSEN, a ſtrong town of Livonia in Ruſſia on the river Dwina. E. Long. 25. 50. N. Lat. 56. 30.

COL, one of the weſtern iſlands of Scotland, which is annexed to the county of Argyle It is 12 miles long, and 9 broad. It abounds in corn, paſture, ſalmon, eels, and cod. The inhabitants are chiefly employed in the fiſheries. W. Long. 7. 15. N. Lat. 57.

COLAPIS, Colops, in *Ancient Geography*, a river of Liburnia, which after a winding north-eaſt courſe, falls into the Savus, at the Inſula Segeſtica. Now the *Culpe*, the boundary of the Alps, running through Croatia into the Save. Colapiani, the people living on it (Pliny).

COLARBASIANS, or Colorbasians, a ſet of Chriſtians in the ſecond century; ſo called from their leader Colarbaſus, a diſciple of Valentinus; who, with Marcus, another diſciple of the ſame maſter, maintained the whole plenitude and perfection of truth and religion to be contained in the Greek alphabet; and that it was upon this account that Jeſus Chriſt was called the *alpha* and *omega*. This ſect was a branch of the Valentinians. See alſo Marcosians.

COLBERG, a ſtrong, handſome ſea-port town of Germany in Pomerania, belonging to the king of Pruſſia. It is remarkable for its ſalt works; and is ſeated at the mouth of the river Perſant, on the Baltic ſea, 60 miles north-eaſt of Stetin, and 30 north-eaſt of Camin. It was taken by the Ruſſians in 1761, but reſtored at the ſubſequent peace. E. Long. 15. 39. N. Lat. 54. 21.

COLBERT, John Baptist, marquis of Segnelai, one of the greateſt ſtateſmen that France ever had, was born at Paris in 1619; and deſcended from a family that lived at Rheims in Champagne, no way conſiderable for its ſplendour and antiquity. His grandfather is ſaid to have been a wine merchant, and his father at firſt followed the ſame occupation; but afterwards became clerk to a notary. In 1648, his relation John Baptiſt Colbert, lord of S. Pouange, preſented him to the ſervice of Michael le Tellier, ſecretary of ſtate, whoſe ſiſter he had married; and here he diſcovered ſuch diligence, and exactneſs in executing all the commiſſions that were entruſted to his care, that he quickly grew diſtinguiſhed. One day his maſter ſent him to Cardinal Mazarine, who was then at Sedan, with a letter written by the queen-mother; and ordered him to bring it back, after that miniſter had ſeen it. Colbert carried the letter, and would not return without it, though the cardinal treated him roughly, uſed ſeveral arts to deceive him, and obliged him to wait for it ſeveral days. Some time after, the cardinal returning to court, and wanting one to write his agenda or memoranda, deſired Le Tellier to furniſh him with a fit perſon for that employment: and Colbert being preſented to him, the cardinal had ſome remembrance of him, and deſired to know where he had ſeen him. Colbert was afraid of putting him in mind of Sedan, leſt the remembrance of his importunacy, in demanding the queen's letter, ſhould renew the cardinal's anger. But his eminency was ſo far from hating him for his faithfulneſs to his late maſter, that he received him, on condition that he ſhould ſerve him with the like zeal and fidelity.

Colbert applied himſelf wholly to the advancement of his maſter's intereſts, and gave him ſo many marks of his diligence and ſkill, that afterwards he made him his intendant. He accommodated himſelf ſo dexterouſly to the inclinations of that miniſter, by retrenching his ſuperfluous expences, that he was entruſted with the management of that gainful trade of ſelling benefices and governments. It was by Colbert's counſel, that the cardinal obliged the governors of frontier places to maintain their garriſons with the contributions they exacted; with which advice his eminency was extremely pleaſed. He was ſent to Rome to negociate the reconciliation of Cardinal de Rets, for which the pope had ſhowed ſome concern; and to perſuade his holineſs to conſent to the diſincamerating of Caſto, according to the treaty concluded with his predeceſſor Urban VIII. Upon the whole, Mazarine had ſo high an opinion of Colbert's abilities, and withal ſuch a regard for his faithful ſervices, that at his death, which happened in 1661, he earneſtly recommended him to Louis XIV. as the propereſt perſon to regulate the finances, which at that time ſtood in much need of reformation. Louis accepted the recommendation, and made Colbert intendant of the finances. He applied himſelf to their regulation, and ſucceeded, though it procured him many enemies, and ſome affronts. France is alſo obliged to this miniſter for eſtabliſhing at that time her trade with the Eaſt and Weſt Indies: a great deſign, and from which ſhe has reaped innumerable advantages.

In 1664, he became ſuperintendant of the buildings; and from that time applied himſelf ſo earneſtly to the enlarging and adorning of the royal edifices, that they are at preſent ſo many maſterpieces of architecture: witneſs the palace of the Thuilleries, the Louvre, St Germain, Fountainbleau, and Chambord. As for Verſailles, it may be ſaid that he raiſed it from the ground. It was formerly a dog-kennel, where Louis XIII. kept his hunting furniture: it is now a palace fit for the greateſt monarch. But royal palaces were not Colbert's only care: he formed ſeveral deſigns for increaſing the beauty and convenience of the capital city, and he did it with great magnificence and grandeur. The public was obliged to this ſame miniſter for the eſtabliſhment of the academy for painting and ſculpture in 1664. The king's painters and ſculptors, with other ſkilful profeſſors of thoſe arts, being proſecuted at law by the maſter-painters at Paris, joined together, and began to form a ſociety, under the name of the Royal Academy for Sculpture and Painting. Their deſign was to keep public exerciſes, for the ſake of improving thoſe fine arts, and advancing them to the higheſt degree of perfection. They put themſelves under the protection of Mazarine, and choſe Chancellor Seguier their vice-protector; and after Mazarine's death choſe Seguier their protector, and Colbert their vice-protector. It was at his ſolicitation that they were finally eſtabliſhed by a patent, containing new privileges, in 1664. Colbert, being made protector after the death of Seguier, thought fit that a hiſtoriographer ſhould be appointed, whoſe buſineſs it ſhould be to collect all curious and uſeful obſervations that might be made at their conferences. This was accordingly done; and his majeſty was pleaſed to ſettle on him a ſalary of 300 livres. To Colbert alſo the lovers of naval knowledge are obliged for the erection of the Academy of Sciences, for the making of which the more uſeful, he cauſed to be erected, in 1667, the royal obſervatory at Paris, which was firſt inhabited by Caſſini. But theſe are not the only obligations France has to that miniſter. She owes to him all the advantages ſhe receives by the union of the two ſeas; a prodigious work, begun in 1666 and finiſhed in 1680. Colbert was alſo very intent upon matters of a more private nature, ſuch as regarded the order, decency, and well-being of ſociety. He undertook to reform the courts of juſtice, and to put a ſtop to the uſurpation of noble titles, which it ſeems was then very common in France. In the former of theſe attempts he failed, in the latter he ſucceeded.

In 1669, he was made ſecretary of ſtate, and entruſted with the management of affairs relating to the ſea; and his performances in this province were anſwerable to the confidence his majeſty repoſed in him. He ſuppreſſed ſeveral offices, which were chargeable, but uſeleſs; and in the mean time, perceiving the king's zeal for the extirpation of hereſy, he ſhut up the chamber inſtituted by the edicts of Paris and Roan. He propoſed ſeveral new regulations concerning criminal courts, and was extremely ſevere with the parliament of Thoulouſe for obſtructing the meaſures he took to carry the ſame into execution. His main deſign in reforming the tedious methods of proceeding at law, was to give the people more leiſure to apply themſelves to trading; for the advancement of which he procured an edict, to erect a general inſurance-office at Paris, for merchants, &c. In 1672, he was made miniſter of ſtate; for how buſied ſoever he was in the regulation of public affairs, yet he never neglected his own or his family's intereſt and grandeur, or miſſed any opportunity of advancing either. He had been married many years, had ſons and daughters grown up, all of which, as occaſion ſerved, he took care to marry to great perſons. For though he had no reaſon to doubt of his maſter's favour, yet he wiſely ſecured his fortune by powerful alliances. However, buſineſs was certainly Colbert's natural turn, and he not only loved it, but was very impatient to be interrupted in it, as the following anecdote may ſerve to ſhow. A lady of great quality was one day urging him, when he was in the height of his power, to do her ſome piece of ſervice, and perceiving him inattentive and inflexible, threw herſelf at his feet, in the preſence of above 100 perſons, crying, "I beg your greatneſs, in the name of God, to grant me this favour." Upon which Colbert, kneeling down over againſt her, replied, in the ſame mournful tone, "I conjure you, madam, in the name of God, not to diſturb me."

This great miniſter died of the ſtone, September 6. 1683, in his 65th year, leaving behind him ſix ſons and three daughters. He was of a middle ſtature, rather lean than fat. His mien was low and dejected, his air gloomy, and his aſpect ſtern. He ſlept little, and was very ſober. Though naturally ſour and moroſe, he knew how to act the lover, and had miſtreſſes. He was of a ſlow conception, but ſpoke judiciouſly of every thing after he had once comprehended it. He underſtood buſineſs perfectly well, and he purſued it with unwearied application. Thus he filled the moſt important places with high reputation and credit; and his influence diffuſed itſelf through every part of the government. He reſtored the finances, the navy, the commerce; and he erected thoſe various works of art, which have ever ſince been monuments of his taſte and magnificence. He was a lover of learning, though he never applied to it himſelf; and therefore conferred donations and penſions upon ſcholars in other countries, while he eſtabliſhed and protected academies in his own. He invited into France painters, ſtatuaries, mathematicians, and artiſts of all kinds, who were any way eminent, thus giving new life to the ſciences, and making them flouriſh, as they did, exceedingly. Upon the whole, he was a wiſe, active, generous-ſpirited miniſter; ever attentive to the intereſts of his maſter, the happineſs of the people, the progreſs of arts and manufactures, and in ſhort to every thing that could advance the credit and intereſt of his country. He was a pattern for all miniſters of ſtate; and every nation may wiſh themſelves bleſſed with a Colbert.

COLCHESTER, the chief town of Eſſex, is pleaſantly ſituated upon an eminence, gradually riſing on the ſouth ſide of the river Colne. It is the ancient *Colonia Camulodunum*, from which word, *Colonia*, both the town and the river Colne received their names. The Saxons called it Colneceaſter. That it flouriſhed under the Romans, ſeveral buildings full of their bricks, and innumerable quantities of coin dug in and about it, fully evince. In the year 1763, a curious teſſellated or moſaic pavement was found in a garden three feet under the ſurface of the earth. The emperor Conſtantine the Great was born here, his mother Helen being daughter of Cool, governor or king of this diſtrict under the Romans. She is ſaid to have found out the croſs of Chriſt at Jeruſalem; and on that account

count the arms of this town are a croſs regulee between three ducal coronets, two in chief and one in baſe, the coronet in baſe paſſing through the croſs.

The walls of the town are ſtill tolerably entire on the ſouth, eaſt, and weſt ſides, but much decayed on the north ſide; they are generally about nine feet thick. By a ſtatute of Henry VIII. this town was made the ſee of a ſuffragan biſhop.

This town is the moſt noted in England for making of baize; it is alſo of ſpecial note for candying the eringo roots, and for oyſters.

In the concluſion of the civil war 1648, this town ſuſtained a ſevere ſiege of 10 weeks; and the beſieged making a very gallant defence, it was changed into a blockade, wherein the garriſon and inhabitants ſuffered the utmoſt extremity of hunger, being reduced to the neceſſity of eating horſe-fleſh, dogs, and cats, and were at laſt obliged to ſurrender at diſcretion, when their two valiant chief officers, Sir Charles Lucas, and Sir George Liſle, were ſhot under the caſtle walls in cold blood. Colcheſter is a borough by preſcription, and under that right ſends two members to parliament, all their charters being ſilent on that head. The charter was renewed in 1763. The town is now governed by a mayor, recorder, 12 aldermen, 18 aſſiſtants, 18 common-council men. Quarter ſeſſions are held here four times in the year.

The famous abbey-gate of St John is ſtill ſtanding, and allowed to be a ſurpriſing, curious, and beautiful piece of Gothic architecture, great numbers of perſons coming from diſtant places to ſee it. It was built, together with the abbey, in 1097; and Guido, ſteward to King William Rufus, laid the firſt ſtone.

St Ann's chapel, ſtanding at the eaſt end of the town, is valuable in the eſteem of antiquarians as a building of great note in the early days of Chriſtianity, and made no ſmall figure in hiſtory many centuries paſt. It is ſtill pretty entire. St Botoph's priory was founded by Ernulphus, in the reign of Henry I. in the year 1110. It was demoliſhed in the wars of Charles I. by the parliament army under Sir Thomas Fairfax. The ruins ſtill exhibit a beautiful ſketch of ancient maſonry, much admired by the lovers of antiquities. The caſtle is ſtill pretty entire, and is a magnificent ſtructure, in which great improvements have of late been made. Here is an excellent and valuable library.

The markets, which are on Wedneſday and Saturday, are very well ſupplied with all kinds of proviſions. There are no fewer than ſix diſſenting meeting houſes in this town. Colcheſter is 51 miles from London, and 22 ENE of Chelmsford. It had 16 pariſh churches, in and out of the walls, only 12 of which are now uſed, the reſt being damaged at the ſiege in 1648. E. Long. 1. 0. N. Lat. 51. 55.

COLCHI (Arrian, Ptolemy), a town of the Hither India, thought to be *Cochin*, on the coaſt of Malabar; now a factory and ſtrong fort of the Dutch. E. Long. 75. 0. N. Lat. 10. 0.

COLCHICUM, MEADOW-SAFFRON. See BOTANY *Index*.

COLCHIS, a country of Aſia, at the ſouth of Aſiatic Sarmatia, eaſt of the Euxine ſea, north of Armenia, and weſt of Iberia. It is famous for the expedition of the Argonauts, and as the birth-place of Medea. It was fruitful in poiſonous herbs, and produced excellent flax. The inhabitants were originally Egyptians, who ſettled there when Seſoſtris king of Egypt extended his conqueſts in the north.

COLCOTHAR, the ſubſtance remaining after the diſtillation or calcination of martial vitrol or ſulphate of iron. See CHEMISTRY *Index*.

COLD, in a relative ſenſe, ſignifies the ſenſation produced by the abſtraction of heat from the body.

The nature of cold, and the methods of producing it artificially, have been treated of under the article CHEMISTRY, to which we refer the reader.

Great degrees of cold occur naturally in many parts of the globe in the winter-time. In the winter of 1780, Mr Wilſon of Glaſgow obſerved, that a thermometer laid on the ſnow ſunk to 25° below 0; but this was only for a ſhort time; and in general our atmoſphere does not admit of very great degrees of cold for any length of time. In 1732, the thermometer at Peterſburg ſtood at 28° below 0; and in 1737, when the French academicians wintered at the north polar circle, or near it, the thermometer ſunk to 33° below 0; and in the Aſiatic and American continent, ſtill greater degrees of cold are very common.

The effects of theſe extreme degrees of cold are very ſurpriſing. Trees are burſt, rocks rent, and rivers and lakes frozen ſeveral feet deep; metallic ſubſtances bliſter the ſkin like red-hot iron: the air, when drawn in by reſpiration, hurts the lungs, and excites a cough: even the effects of fire in a great meaſure ſeem to ceaſe; and it is obſerved, that though metals are kept for a conſiderable time before a ſtrong fire, they will ſtill freeze water when thrown upon them. When the French mathematicians wintered at Torneo in Lapland, the external air, when ſuddenly admitted into their rooms, converted the moiſture of the air into whirls of ſnow; their breaſts ſeemed to be rent when they breathed it, and the contact of it was intolerable to their bodies; and the alcohol, which had not been highly rectified, burſt ſome of their thermometers by the congelation of the aqueous part.

Extreme cold very often proves fatal to animals in thoſe countries where the winters are very ſevere; and thus 7000 Swedes periſhed at once in attempting to paſs the mountains which divide Norway from Sweden. It is not neceſſary, indeed, that the cold, in order to prove fatal to the human life, ſhould be ſo very intenſe as has been juſt mentioned. There is only requiſite a degree ſomewhat below 32° of Fahrenheit, accompanied with ſnow or hail, from which ſhelter cannot be obtained. The ſnow which falls upon the clothes, or the uncovered parts of the body, then melts, and by a continual evaporation carries off the animal heat to ſuch a degree, that a ſufficient quantity is not left for the ſupport of life. In ſuch caſes, the perſon firſt feels himſelf extremely chill and uneaſy; he begins to turn liſtleſs, unwilling to walk or uſe exerciſe to keep himſelf warm; and at laſt turns drowſy, ſits down to refreſh himſelf with ſleep, but wakes no more. An inſtance of this was ſeen not many years ago at Terra del Fuego, where Dr Solander, with ſome others, having taken an excurſion up the country, the cold was ſo intenſe, that one of their number died. The Doctor himſelf, though he had warned his companions of the danger of ſleeping in that ſituation, yet could not be prevented from making that dangerous experiment himſelf; and though he was awakened with all poſſible expedition, his body was ſo much ſhrunk in bulk, that his ſhoes fell off his feet, and it was with the utmoſt difficulty that he was recovered.

In thoſe parts of the world where vaſt maſſes of ice are produced, the accumulation of it, by abſorbing the heat of the atmoſphere, occaſions an abſolute ſterility in the adjacent countries, as is particularly the caſe with the iſland of Iceland, where the vaſt collections of ice floating out from the Northern ocean, and ſtopped on that coaſt, are ſometimes ſeveral years in thawing. Indeed, where great quantities of ice are collected, it would ſeem to have a power like fire, both augmenting its own cold and that of the adjacent bodies. An inſtance of this is related under the article Evaporation, in Mr Wedgewood's experiment, where the true cauſe of this phenomenon is alſo pointed out.

Cold, in *Medicine*. See Medicine *Index*.

Cold. See Farriery *Index*.

COLDENIA. See Botany *Index*.

COLDINGHAM, ſuppoſed to be the *Colonia* of Ptolemy, and called by Bede the city Coldana and of Colud (*Coludum*), ſituated on the borders of Scotland, about two miles from Eyemouth, was a place famous many ages ago for its convent. This was the oldeſt nunnery in Scotland, for here the virgin-wife Etheldreda took the veil in 670; but by the ancient name *Coludum* it ſhould ſeem that it had before been inhabited by the religious called *Culdees*. In 870 it was deſtroyed by the Danes, but its name rendered immortal by the heroiſm of its nuns; who, to preſerve themſelves inviolate from thoſe invaders, cut off their lips and noſes; and thus rendering themſelves objects of horror, were, with their abbeſs Ebba, burnt in the monaſtery by the diſappointed ſavages. After this it lay deſerted till the year 1098, when King Edgar founded on its ſite a priory of Benedictines in honour of St Cuthbert, and beſtowed it on the monk of Durham.

Mr Peanant's deſcription of the black, joyleſs, heathy moor, where it was ſituated, might be ſufficient to guard the fair inhabitants of the nunnery were it ſtill ſubſiſting. That deſcription, however, is now altogether inapplicable: The whole tract, five miles over, has been ſince improved, and converted into corn fields; the cheerleſs village of Old Cambus is no more; a decent inn with good accommodations has been eſtabliſhed at a convenient diſtance; and the paſſage of the ſteep glen called the *Peaſe*, which terminates the moor on the road towards Edinburgh, and was formerly the terror of travellers, is now rendered ſafe and eaſy by means of a bridge extending from one ſide of the chaſm to the other.

COLDINGUEN, a town of Denmark, in North Jutland, and dioceſe of Ripen. It is remarkable for its bridge, over which paſs all the oxen and other cattle that go from Jutland into Germany, which brings in a conſiderable revenue to the king. It is ſeated on an eminence, in a pleaſant country abounding with game. E. Long. 9. 25. N. Lat. 55. 35.

COLD-finch, a ſpecies of Motacilla. See Ornithology *Index*.

COLD-SHIRE iron, that which is brittle when cold.

COLE, William, the moſt famous botaniſt of his time, was born at Adderbury in Oxfordſhire about the year 1626, and ſtudied at Merton college in Oxford. He at length removed to Putney, near London; and publiſhed "The Art of Simpling; and Adam in Eden, or Nature's Paradiſe." Upon the reſtoration of King Charles II. he was made ſecretary to Dr Duppa, biſhop of Wincheſter; but died two years after, aged 37.

COLE-fish, a ſpecies of Gadus. See Ichthyology *Index*.

Cole-Seed, the ſeed of the *napus ſativa*, or long-rooted, narrow-leaved rapa, called in Engliſh *navew*, and reckoned by Linnæus among the braſſicas, or cabbage kind. See Brassica.

This plant is cultivated to great advantage in many parts of England, on account of the rape oil expreſſed from its ſeeds. The practice of ſowing it was firſt introduced by the Germans and Dutchmen who drained the fens of Lincolnſhire; and hence the notion hath generally prevailed, that it will thrive only in a marſhy ſoil; but this is now found to be a miſtake. In preparing the land which is to receive it, care muſt be taken to plow it in May, and again about midſummer, making the ground as fine and even as poſſible. It is to be ſown the very day of the laſt plowing, about a gallon on an acre. In the months of January, February, and March, it affords very good food for cattle, and will ſprout again when cut; after which it is excellent nouriſhment for ſheep. After all, if it is not too cloſely fed, it will bear ſeed againſt next July. The ſame caution, however, is requiſite with this food as with clover, till cattle are accuſtomed to it, otherwiſe it is apt to ſwell them. When this plant is cultivated ſolely with a view to the ſeed, it muſt be ſown on deep ſtrong land without dung, and muſt be ſuffered to ſtand till one-half of the ſeeds at leaſt are turned brown; which, according to the ſeaſons, will be ſometimes ſooner, ſometimes later. In this ſtate it is to be cut in the ſame manner and with the ſame care as wheat; and every handful as it is cut is to be regularly ranged on ſheets, that it may dry leiſurely in the ſun, which will commonly be in a fortnight; after which it is to be carefully threſhed out, and carried to the mill for expreſſing the oil. The produce of cole-ſeed is generally from five to eight quarters on an acre; and is commonly ſold at 20s. per quarter.

COLEOPTERA, or beetle, the name of Linnæus's firſt order of inſects. See Entomology *Index*.

COLEWORT. See Brassica.

COLERAIN, a large town of Ireland, in the county of Londonderry and province of Ulſter; ſeated on the river Bann, for miles ſouth of the ocean, in W. Long. 7. 2. N. Lat. 55. 10. It was formerly a place of great conſideration, being the chief town of a county erected by Sir John Perrot, during his government of Ireland; whereas it is now only the head of one of the baronies in the county of Londonderry; but it is ſtill a corporation, and ſends two members to parliament. It is of a tolerable ſize, and very elegantly built. The port is very indifferent, occaſioned by the extreme rapidity of the river, which repels the tide, and makes the coming up to the town difficult; ſo that it has but little trade, and might perhaps have leſs, if it was not for the valuable ſalmon-fiſhery, which amounts to ſome thouſand pounds a-year. If the navigation of the Bann could be opened, which is totally obſtructed by a ridge of rocks, it would quickly change the face of things; for then, by the help of this river, and the Newry canal, there would be a direct communication acroſs the kingdom, and, with the aſſiſtance of the Black-water river, which likewiſe falls into Lough Neagh, almoſt all the counties of the province of Ulſter might have a correſpondence with each other by water-carriage, to their reciprocal and very great emolument

COLES, Elisha, author of the well known Latin and Engliſh dictionary, was born in Northamptonſhire about the year 1640; and was entered of Magdalene College Oxford, which he left without taking a degree; and taught Latin to young people, and Engliſh to foreigners, in London, about the year 1663. He afterwards became an uſher in Merchant-taylors ſchool; but for ſome great fault, nowhere expreſsly mentioned, he was forced to withdraw to Ireland, whence he never returned. He was, however, a good critic in the Engliſh and Latin tongues; and wrote ſeveral uſeful books of inſtruction in his profeſſion.

COLET, John, dean of St Paul's, the ſon of Henry Colet knight, was born in London in the year 1466. His education began in St Anthony's ſchool in that city, from whence, in 1483, he was ſent to Oxford, and probably to Magdalene college. After ſeven years ſtudy of logic and philoſophy, he took his degrees in arts. About the year 1493, Mr Colet went to Paris and thence to Italy, probably with a deſign to improve himſelf in the Greek and Latin languages, which at this time were imperfectly taught in our univerſities. On his return to England in 1497, he took orders; and returned to Oxford, where he read lectures *gratis*, on the epiſtles of St Paul. At this time he poſſeſſed the rectory of St Dennington in Suffolk, to which he had been inſtituted at the age of 10. He was alſo prebendary of York, and canon of St Martin's le Grand in London. In 1502 he became prebendary of Sarum; prebendary of St Paul's in 1505; and immediately after dean of that cathedral, having previouſly taken the degree of doctor of divinity. He was no ſooner raiſed to this dignity, than he introduced the practice of preaching and expounding the ſcriptures; and ſoon after eſtabliſhed a perpetual divinity lecture in St Paul's church, three days in every week; an inſtitution which gradually made way for the reformation. About the year 1508, Dean Colet formed his plan for the foundation of St Paul's ſchool, which he completed in 1512, and endowed with eſtates to the amount of 122l. and upwards. The celebrated grammarian, William Lyle, was his firſt maſter, and the company of mercers were appointed truſtees. The dean's notions of religion were ſo much more rational than thoſe of his contemporary prieſts, that they deemed him little better than a heretic; and on that account he was ſo frequently moleſted, that he at laſt determined to ſpend the reſt of his days in peaceful retirement. With this intention he built a houſe near the palace of Richmond; but, being ſeized with the ſweating ſickneſs, he died in 1519, in the 53d year of his age. He was buried on the ſouth ſide of the choir of St Paul's; and a ſtone was laid over his grave, with no other inſcription than his name. Beſides the preferments above mentioned, he was rector of the guild of Jeſus at St Paul's, and chaplain to King Henry VIII. Dean Colet, though a Papiſt, was an enemy to the groſs ſuperſtitions of the church of Rome. He diſapproved auricular confeſſion, the celibacy of the prieſts, and ſuch other ridiculous tenets and ceremonies as have ever been condemned by men of ſound underſtanding in every age and country. He wrote, 1. *Rudimenta grammatices*. 2. The conſtruction of the eight parts of ſpeech, 3. Daily devotions. 4. *Epiſtolæ ad Eraſmum*. 5. Several ſermons: and other works which ſtill remain in manuſcript.

COLIBERTS (*Coliberti*), in *Law*, were tenants in ſoccage, and particularly ſuch villeins as were manumitted or made freemen. But they had not an abſolute freedom; for though they were better than ſervants, yet they had ſuperior lords to whom they paid certain duties, and in that reſpect might be called ſervants, though they were of middle condition between freemen and ſervants.

COLIC, a ſevere pain in the lower venter, ſo called becauſe the colon was formerly ſuppoſed to be the part affected. See Medicine-*Index*.

Colic, in *Farriery*. See Farriery *Index*.

COLIGNI, Gaspard de, admiral of France, was born in 1516. He ſignalized himſelf in his youth, in the reigns of Francis I. and Henry II. and was made colonel of infantry and admiral of France in 1552. Henry II. employed him in the moſt important affairs; but after the death of that prince, he embraced the reformed religion, and became the chief of the Proteſtant party: he ſtrongly oppoſed the houſe of Guiſe, and rendered this oppoſition ſo powerful, that it was thought he would have overturned the French government. On the peace made after the battles of Jarnac and Montcontour, Charles IX. deluded Coligni into ſecurity by his deceitful favours; and though he recovered one attempt on his life, when he attended the nuptials of the prince of Navarre, yet he was included in the dreadful maſſacre of the Proteſtants on St Bartholomew's day 1572, and his body treated with wanton brutality by a miſguided Popiſh populace.

COLIMA, a ſea-port town of Mexico in North America, and capital of a fertile valley of the ſame name. It is ſeated at the mouth of a river, in W. Long. 109. 6. N. Lat. 18. 30.

COLIOURE, a ſmall, but ancient and ſtrong town of France, in Rouſillon, ſeated at the foot of the Pyrenean mountains, with a ſmall harbour. E. Long. 3. 10. N. Lat. 43. 24.

COLIR, an officer in China, who may properly be called an inſpector, having an eye over what paſſes in every court or tribunal of the empire. In order to render him impartial, he is kept independent, by having his poſt for life. The power of the colirs is ſuch, that they make even the princes of the blood tremble.

COLISEUM, or Colisæum, in the ancient architecture, an oval amphitheatre, built at Rome by Veſpaſian, in the place where ſtood the baſon of Nero's gilded houſe. The word is formed from *coloſſæum* on account of the coloſſus of Nero that ſtood near it;

or, according to Nardini, from the Italian *coliſeo*. In this were placed ſtatues, repreſenting all the provinces of the empire; in the middle whereof ſtood that of Rome, holding a golden apple in her hand. The ſame term, *coliſeum*, is alſo given to another amphitheatre of the emperor Severus. In theſe *coliſea* were repreſented games, and combats of men and wild beaſts; but there is now little remaining of either of them, time and war having reduced them to ruins.

COLLAËRT, Adrian, an eminent engraver who flouriſhed about 1550, was born at Antwerp. After having learned in his own country the firſt principles of engraving, he went to Italy, where he reſided ſome time to perfect himſelf in drawing. He wrought entirely with the graver, in a firm neat ſtyle, but rather ſtiff and dry. The vaſt number of plates executed by his hand ſufficiently evince the facility with which he engraved; and though exceedingly neat, yet they are ſeldom highly finiſhed.

Collaert, *Hans* or *John*, ſon to the foregoing, was alſo an excellent artiſt. He drew and engraved exactly in the ſtyle of his father, and was in every reſpect equal to him in merit. He muſt have been very old when he died; for his prints are dated from 1555 to 1622. He aſſiſted his father in all his great works, and engraved beſides a prodigious number of plates of various ſubjects. One of his beſt prints is *Moſes ſtriking the rock*, a large print, lengthwiſe, from Lambert Lombard. A great number of ſmall figures are introduced into this print; and they are admirably well executed: the heads are fine, and the drawing very correct.

COLLAR, in Roman antiquity, a ſort of chain put generally round the neck of ſlaves that had run away, after they were taken, with an inſcription round it, intimating their being deſerters, and requiring their being reſtored to their proper owners, &c.

Collar, in a more modern ſenſe, an ornament conſiſting of a chain of gold, enamelled, frequently ſet with ciphers or other devices, with the badge of the order hanging at the bottom, wore by the knights of ſeveral military orders over their ſhoulders, on the mantle, and its figure drawn round their armories.

Thus, the collar of the order of the garter conſiſts of S. S. with roſes enamelled red, within a garter enamelled blue, and the George at the bottom.

Lord Mayor's Collar is more uſually called chain. See Chain.

Knights of the Collar, a military order in the republic of Venice, called alſo the order of St Mark, or the medal. It is the doge and the ſenate that confer this order; the knights bear no particular habit, only the collar, which the doge puts around their neck, with a medal, wherein is repreſented the winged lion of the republic.

Collar *of a Draught-horſe*, a part of harneſs made of leather and canvas, and ſtuffed with ſtraw or wool, to be put about the horſe's neck.

COLLARAGE, a tax or fine laid for the collars of wine-drawing horſes.

COLLATERAL, any thing, place, country, &c. ſituated by the ſide of another.

Collateral, in genealogy, thoſe relations which proceed from the ſame ſtock, but not in the ſame line of aſcendants or deſcendants, but being, as it were, aſide of each other. Thus, uncles, aunts, nephews, nieces, and couſins, are collaterals, or in the ſame collateral line: thoſe in a higher degree, and nearer the common root, repreſent a kind of paternity with regard to thoſe more remote. See Consanguinity.

Collateral Succeſſion. When a defunct, for want of heirs deſcended of himſelf, is ſucceeded in his eſtate by a brother or ſiſter, or their deſcendants, the eſtate is ſaid to have gone to *collateral heirs*.

COLLATIA, in *Ancient Geography*, a town of the Sabines, thought to be diſtant between four or five miles from Rome to the eaſt; ſituated on an eminence (Virgil). Of this place was Tarquinius Collatinus, married to Lucretia, raviſhed by Sextus Tarquinius (Livy); ſituated on this or on the left ſide of the Anio (Pliny). Extant in Cicero's time, but in Strabo's day only a village; now no trace of it remains.—Another ſuppoſed *Collatia* of Apulia, near Mount Garganus, becauſe Pliny mentions the *Collatini* in Apulia, and Frontinus the *Ager Collatinus*.

COLLATINA porta, a gate of Rome, at the Collis Hortulorum, afterwards called *Pinciana*, from the Pincii, a noble family. Its name *Collatina* is from *Collatia*, to the right of which was the Via Collatina, which led to that town.

COLLINA; a gate of Rome at the Collis Quirinalis, not far from the temple of Venus Erycina (Ovid); called alſo *Salaria*, becauſe the Sabines carried their ſalt through it (Tacitus). Now *Salaro*.

COLLATION, in the canon law, the giving or beſtowing of a benefice on a clergyman by a biſhop, who has it in his own gift or patronage. It differs from inſtitution in this, that inſtitution is performed by the biſhop, upon the preſentation of another; and collation is his own gift of preſentation; and it differs from a common preſentation, as it is the giving of the church to the perſon, and preſentation is the giving or offering of the perſon to the church. But collation ſupplies the place of preſentation and inſtitution, and amounts to the ſame as inſtitution where the biſhop is both patron and ordinary. Anciently the right of preſentation to all churches was in the biſhop; and now if the patron neglects to preſent to a church, this right returns to the biſhop by collation. If the biſhop neglects to collate within ſix months after the elapſe of the patron, then the archbiſhop hath a right to do it; and if the archbiſhop neglects, then it devolves to the king; the one as ſuperior, to ſupply the defects of biſhops, the other as ſupreme, to ſupply all defects of government.

Collation, in common law, the compariſon or preſentation of a copy to its original, to ſee whether or not it be conformable; or the report or act of the officer who made the compariſon. A collated act is equivalent to its original, provided all the parties concerned were preſent at the collation.

Collation, in *Scots Law*, that right which an heir has of throwing the whole heritable and moveable eſtates of the deceaſed into one maſs, and ſharing it equally with the others in the ſame degree of kindred, when he thinks ſuch ſhare will be more than the value of the heritage to which he had an excluſive title.

Collation is alſo uſed among the Romaniſts for the meal or repaſt made on a faſt-day, in lieu of a ſupper. Only fruits are allowed in a collation: F. Lobineau.

neau obſerves, that anciently there was not allowed even bread in the collations in Lent, nor any thing beſide a few comfits and dried herbs and fruits; which cuſtom, he adds, obtained till the year 1513. Cardinal Humbert obſerves farther, that in the middle of the 11th century there were no collations at all allowed in the Latin church in the time of Lent; and that the cuſtom of collations was borrowed from the Greeks, who themſelves did not take it up till about the 11th century.

Collation is alſo popularly uſed for a repaſt between meals, particularly between dinner and ſupper. The word collation, in this ſenſe, Du Cange derives from *collocutio*, "conference," and maintains, that originally collation was only a conference, or converſation on ſubjects of piety, held on faſt-days in monaſteries; but that, by degrees, the cuſtom was introduced of bringing in a few refreſhments; and that by the exceſſes to which thoſe ſober repaſts were at length carried, the name of the abuſe was retained, but that of the thing loſt.

Collation of Seals, denotes one ſeal ſet on the ſame label, on the reverſe of another.

COLLEAGUE, a partner or aſſociate in the ſame office or magiſtrature. See Adjunct.

COLLECT, Collection, a voluntary gathering of money, for ſome pious or charitable purpoſe. Some ſay, the name *collect*, or *collection*, was uſed, by reaſon thoſe gatherings were anciently made on the days of *collects*, and in *collects*, i. e. in aſſemblies of Chriſtians; but, more probably, *quia colligebatur pecunia*.

Collect, is ſometimes alſo uſed for a tax, or impoſition, raiſed by a prince for any pious deſign. Thus, hiſtories ſay, that in 1166, the king of England coming into Normandy, appointed a collect for the relief of the holy land, at the deſire and after the example of the king of France. See Croisade.

Collect, in the liturgy of the church of England, and the maſs of the Romaniſts, denotes a prayer accommodated to any particular day, occaſion, or the like. See Liturgy and Mass.

In the general, all the prayers in each office are called *collects*; either becauſe the prieſt ſpeaks in the name of the whole aſſembly, whoſe ſentiments and deſires he ſums up by the word *oremus*, "let us pray," as is obſerved by Pope Innocent III. or, becauſe thoſe prayers are offered when the people are aſſembled together, which is the opinion of Pamelius on Tertullian.

The congregation itſelf is in ſome ancient authors called *collect*. The popes Gelaſius and Gregory are ſaid to have been the firſt who eſtabliſhed *collects*. Deſpence, a doctor of the faculty of Paris, has an expreſs treatiſe on *collects*, their origin, antiquity, authors, &c.

COLLECTIVE, among grammarians, a term applied to a noun expreſſing a multitude, though itſelf be only ſingular; as an army, company, troop, &c. called *collective nouns*.

COLLECTOR, in general, denotes a perſon who gets or brings together things formerly diſperſed and ſeparated. Hence,

Collector, in matters of civil polity, is a perſon appointed by the commiſſioners of any duty, the inhabitants of a pariſh, &c. to raiſe or gather any kind of tax.

Collector, among botaniſts, one who gets together as many plants as he can, without ſtudying botany in a ſcientifical manner.

COLLEGATORY, in the *Civil Law*, a perſon who has a legacy left him in common with one or more other perſons.

COLLEGE, an aſſemblage of ſeveral bodies or ſocieties, or of ſeveral perſons into one ſociety.

College, among the Romans, ſerved indifferently for thoſe employed in the offices of religion, of government, the liberal and even mechanical arts and trades; ſo that, with them, the word ſignified what we call a corporation or company.

In the Roman empire, there were not only the *college of augurs*, and the *college of capitolini*, i. e. of thoſe who had the ſuperintendence of the capitoline games; but alſo colleges of artificers, *collegia artificum*; college of carpenters, *fabricorum*, or *fabrorum tignariorum*; of potters, *figulorum*; of founders, *ærariorum*; the college of lockſmiths, *fabrorum ferrariorum*; of engineers of the army, *tignariorum*; of butchers, *laniorum*; of dendrophori, *dendrophororum*; of centonaries, *centonariorum*; of makers of military caſques, *ſagatiorum*; of tent-makers, *tabernaculariorum*: of bakers, *piſtorum*; of muſicians, *tibicinum*, &c. Plutarch obſerves, that it was Numa who firſt divided the people into colleges, which he did to the end that each conſulting the intereſts of their college, whereby they were divided from the citizens of the other colleges, they might not enter into any general conſpiracy againſt the public repoſe.

Each of theſe colleges had diſtinct meeting places or halls; and likewiſe, in imitation of the ſtate, a treaſury and common cheſt, a regiſter, and one to repreſent them, upon public occaſions, and acts of government. Theſe colleges had the privilege of manumitting ſlaves, of being legates, and making by-laws for their own body, provided they did not claſh with thoſe of the government.

There are various colleges on foot among the moderns, founded on the model of thoſe of the ancients. Such are the three colleges of the empire, viz.

College of Electors, or their Deputies, aſſembled in the diet of Ratiſbon.

College of Princes; the body of princes, or their deputies at the diet of Ratiſbon.

College of Cities, is, in like manner, the body of deputies which the imperial cities ſend to the diet.

College of Cardinals, or the *Sacred College*; a body compoſed of the three orders of cardinals. See Cardinals.

College is alſo uſed for a public-place endowed with certain revenues, where the ſeveral parts of learning are taught.

An aſſemblage of ſeveral of theſe colleges conſtitutes an univerſity. The erection of colleges is part of the royal prerogative, and not to be done without the king's licenſe.

The eſtabliſhment of colleges or univerſities is a remarkable period in literary hiſtory. The ſchools in cathedrals and monaſteries confined themſelves chiefly to the teaching of grammer. There were only ly one or two maſters employed in that office. But, in colleges, profeſſors are appointed to teach all the different parts of ſcience. The firſt obſcure mention of academical degrees in the univerſity of Paris (from which the other univerſities in Europe have borrowed moſt of their cuſtoms and inſtitutions), occurs A. D. 1215.

College of Civilians, commonly called *Doctors Commons*; a college founded by Dr Harvey, dean of the arches, for the profeſſors of the civil law reſiding in London; where uſually, likewiſe, reſide the judge of the arches, court of Canterbury, judge of the admiralty, of the prerogative court, &c. with other civilians; who all live, as to diet and lodging, in a collegiate manner, commoning together; whence the appellation of *Doctors Commons*. Their houſe being comſumed in the great fire, they all reſided at Exeter-houſe in the Strand till 1672; when their former houſe was rebuilt, at their own expence, in a very ſplendid manner. To this college belong 34 proctors, who make themſelves parties for their clients, manage their cauſes, &c.

College of Phyſicians, a corporation of phyſicians in London, who, by ſeveral charters and acts of parliament of Henry VIII. and his ſucceſſors, have certain privileges, whereby no man, though a graduate in phyſic of any univerſity, may, without licenſe, under the ſaid college-ſeal, practiſe phyſic in or within ſeven miles of London; with power to adminiſter oaths, fine and impriſon offenders in that and ſeveral other particulars; to ſearch the apothecaries ſhops, &c. in and about London, to ſee if their drugs, &c. be wholeſome, and their compoſitions according to the form preſcribed by the ſaid college in their diſpenſatory. By the ſaid charter they are alſo freed from all troubleſome offices, as to ſerve on juries, be conſtable, keep watch, provide arms, &c.

The ſociety had anciently a college in Knight-rider-ſtreet, the gift of Dr Linacre, phyſician to king Henry VIII. Since that time they have had a houſe built them by the famous Dr Harvey, in 1652, at the end of Amen-corner, which he endowed with his whole inheritance in his lifetime; but this being burnt in the great fire in 1666, a new one was erected, at the expence of the fellows, in Warwick-lane, with a noble library, given partly by the marquis of Dorcheſter, and partly by Sir Theodore Mayerne.

Of this college there are at preſent a preſident, four cenſors, eight electors, a regiſter, and a treaſurer, choſen annually in October; the cenſors have, by charter, power to ſurvey, govern, and arreſt, all phyſicians, or others practiſing phyſic, in or within ſeven miles of London, and to fine, amerce, and impriſon them, at diſcretion. The number of fellows was anciently thirty, till King Charles II. increaſed their number to forty; and King James II. giving them a new charter, allowed the number of fellows to be enlarged ſo as not to exceed fourſcore; reſerving to himſelf and ſucceſſors the power of placing and diſplacing any of them for the future.

The college is not very rigorous in aſſerting their privileges; there being a great number of phyſicians, ſome of very good abilities, who practiſe in London, &c. without their licenſe, and are connived at by the college; yet, by law, if any perſon not expreſsly allowed to practiſe, take on him the cure of any diſeaſe, and the patient die under his hand, it is deemed felony in the practiſer. In 1696, the college made a ſubſcription, to the number of forty-two of their members, to ſet on foot a diſpenſatory for the relief of the ſick poor: ſince that they have erected two other diſpenſatories.

Edinburgh College of Phyſicians was erected on the 26th November 1681. The deſign of this inſtitution was, to prevent the abuſes daily committed by foreign and illiterate impoſtors, quacks, &c. For this reaſon, his majeſty, at the time above mentioned, granted letters patent to erect into a body corporate and politic, certain phyſicians in Edinburgh and their ſucceſſors, by the title of "the Preſident and Royal College of Phyſicians at Edinburgh," with power to chooſe annually a council of ſeven, one whereof to be preſident: theſe are to elect a treaſurer, clerk, and other officers; to have a common ſeal; to ſue and be ſued; to make laws for promoting the art of phyſic, and regulating the practice thereof within the city of Edinburgh, town of Leith, and diſtricts of the Canongate, Weſtport, Pleaſance, and Potterrow: through all which the juriſdiction of the college extends. Throughout this juriſdiction, no perſon is allowed to practiſe phyſic, without a warrant from the college, under the penalty of 5l. ſterling the firſt month, to be doubled monthly afterwards while the offence is continued; one-half the money ariſing from ſuch fines to go to the poor, the other to the uſe of the college. They are alſo empowered to puniſh all licentiates in phyſic within the above-mentioned bounds, for faults committed againſt the inſtitutions of the college; and to fine them of ſums not exceeding 40s. On ſuch occaſions, however, they muſt have one of the bailies of the city to ſit in judgment along with them, otherwiſe their ſentence will not be valid. They are alſo empowered to ſearch and inſpect all medicines within their juriſdiction, and throw out into the ſtreet all ſuch as are bad or unwholeſome. That they may the better attend their patients, they are exempted from watching, warding, and ſerving on juries. They are, however, reſtrained from erecting ſchools for teaching the art of phyſic, or conferring degrees on any perſon qualified for the office of a phyſician; but are obliged to licenſe all ſuch as have taken their degrees in any other univerſity, and to admit as honorary members all the profeſſors of phyſic in the reſt of the univerſities of Scotland. Theſe privileges and immunities are not, however, to interfere with the rights and privileges of the apothecary-ſurgeons, in their practice of curing wounds, contuſions, fractures, and other external operations.

Edinburgh College of Surgeons. This is but a very late inſtitution, by which the ſurgeons of Edinburgh are incorporated into a *Royal College*, and authorized to carry into execution a ſcheme for making proviſion for their widows and children, &c. They have alſo the privilege of examining and licenſing, if found qualified, all practitioners in ſurgery within certain bounds.

College of Juſtice, the ſupreme civil court of Scotland; otherwiſe called *Court of Seſſion*, or, *of Council and Seſſion*. See Law *Index*.

Sion College, or the college of the London clergy; which has been a religious houſe time out of mind, ſometimes under the denomination of a priory, ſometimes under that of a ſpital or hoſpital: at its diſſolution under 31ſt Henry VIII. it was called *Elſon's Spital*, from the name of its founder, a mercer, in 1329. At preſent it is a compoſition of both, viz. a college for the clergy of London, who were incorporated in 1630, in purſuance to the will of Dr White, under the name of the *Preſident and Fellows of Sion College;* and an hoſpital for ten poor men and as many women. The officers of the corporation are the preſident, two deans, and four aſſiſtants, who are annually choſen from among the rectors and vicars of London; and are ſubject to the viſitation of the biſhop. They have a good library, built and ſtocked by Mr Simpſon, and furniſhed by ſeveral other benefactors, chiefly for the clergy of the city, without excluding other ſtudents on certain terms; and a hall, with chambers for ſtudents, generally occupied by the miniſters of the neighbouring pariſhes.

Greſham College, *or* College *of Philoſophy*; a college founded by Sir Thomas Greſham, and endowed with the revenue of the Royal Exchange. One moiety of this endowment the founder bequeathed to the mayor and aldermen of London and their ſucceſſors, in truſt, that they ſhould find four able perſons to read within the college, divinity, geometry, aſtronomy, and muſic; who are choſen by a committee of the common council, conſiſting of the lord mayor, three aldermen, and eight commoners, and allowed each, beſides lodging, 50l. per annum. The other moiety, he left to the company of mercers, to find three more able perſons, choſen by a committee of that company, conſiſting of the maſter and three wardens, during their office, and eight of the court of aſſiſtants, to read law, phyſic, and rhetoric, on the ſame terms; with this limitation, that the ſeveral lecturers ſhould read in term-time, every day in the week except Sundays; in the morning in Latin, in the afternoon the ſame in Engliſh; but that in muſic to be read only in Engliſh. By 8th Geo. III. cap. 32. the building appropriated to this college was taken down, and the exciſe-office erected in its room. Each of the profeſſors is allowed 50l. per annum, in lieu of the apartments, &c. relinquiſhed by them in the college, and is permitted to marry, notwithſtanding the reſtriction of Sir Thomas Greſham's will. The lectures are now read in a room over the Royal Exchange; and the city and mercer's company are required to provide a proper place for this purpoſe.

In this college formerly met the Royal Society, that noble academy, inſtituted by King Charles II. and celebrated throughout the world for their improvements in natural knowledge. See their hiſtory and policy under Society.

College de Propaganda Fide, was founded at Rome in 1622 by Gregory XV. and enriched with ample revenues. It conſiſts of thirteen cardinals, two prieſts, and a ſecretary; and was deſigned for the propagation and maintenance of the Romiſh religion in all parts of the world. The funds of this college have been very conſiderably augmented by Urban VIII. and many private donations. Miſſionaries are ſupplied by this inſtitution, together with a variety of books ſuited to their ſeveral appointments. Seminaries for their inſtruction are ſupported by it, and a number of charitable eſtabliſhments connected with and conducive to the main object of its inſtitution.

Another college of the ſame denomination was eſtabliſhed by Urban VIII. in 1627, in conſequence of the liberality of John Baptiſt Viles, a Spaniſh nobleman. This is ſet apart for the inſtruction of thoſe who are deſigned for the foreign miſſions. It was at firſt committed to the care of three canons of the patriarchal churches; but ever ſince the year 1641 it is under the ſame government with the former inſtitution.

College of Heralds, commonly called the *Herald's Office*; a corporation founded by charter of King Richard III. who granted them ſeveral privileges, as to be free from ſubſidies, tolls, offices, &c. They had a ſecond charter from King Henry VI.; and a houſe built near Doctors Commons, by the earl of Derby, in the reign of King Henry VII. was given them by the duke of Norfolk, in the reign of Queen Mary, which houſe is now rebuilt.

This college is ſubordinate to the earl marſhal of England. They are aſſiſtants to him in his court of chivalry, uſually held in the common hall of the college, where they ſit in their rich coats of his majeſty's arms. See Herald.

College of Heralds in Scotland, conſiſts of Lyon king at arms, ſix heralds, and ſix purſuivants, and a number of meſſengers. See Lyon.

COLLEGIANS, Collegiani, Collegiants, a religious ſect formed among the Arminians and Anabaptiſts in Holland, about the beginning of the ſeventeenth century; ſo called becauſe of their colleges, or meetings, twice every week, where every one, females excepted, has the ſame liberty of expounding the Scripture, praying, &c. They are ſaid to be all either Arians or Socinians; they never communicate in the college, but meet twice a-year from all parts of Holland at Rhinſbergh, whence they are ſo called *Rhinſberghers*, a village two miles from Leyden, where they communicate together; admitting every one that preſents himſelf, profeſſing his faith in the divinity of the Holy Scriptures, and reſolution to live ſuitably to their precepts and doctrines, without regard to his ſect or opinion. They have no particular miniſters, but each officiates as he is diſpoſed. They never baptize without dipping.

COLLEGIATE, or Collegial, churches, are thoſe which have no biſhop's ſee, yet have the ancient retinue of the biſhop, the *canons and prebends*. Such are Weſtminſter, Rippon, Windſor, &c. governed by deans and chapters.

Of theſe collegiate churches there are two kinds; ſome of royal, and others of eccleſiaſtical foundation; each of them, in matters of divine ſervice, regulated in the ſame manner as the cathedrals. There are even ſome collegiate churches that have the epiſcopal rights. Some of theſe churches were anciently abbeys, which in time were ſecularized. The church of St Peter's, Weſtminſter, was anciently a cathedral; but the revenues of the monaſtery being by act of parliament, 1 Elizabeth veſted in the dean and chapter, it commenced a collegiate church. In ſeveral cauſes the ſtyling it *cathedral*, inſtead of *collegiate church* of Weſtminſter, has occaſioned error in the pleadings.

COLLET, among jewellers, denotes the horizontal face or plane at the bottom of brilliants. See Brilliant.

Collet, in glaſs-making, is that part of glaſs veſſels which ſticks to the iron inſtrument wherewith the metal was taken out of the melting-pot: theſe are afterwards uſed for making green glaſs.

COLLETICS, in *Pharmacy*, denotes much the ſame with Agglutinants or Vulneraries.

COLLIER, Jeremy, a learned Engliſh nonjuring divine, born in 1650, and educated in Caius college Cambridge. He had firſt the ſmall rectory of Ampton, near St Edmund's Bury in Suffolk, which in ſix years he reſigned, to come to London, in 1685, where he was made lecturer of Gray's Inn; but the change of government that followed, ſoon rendered the public exerciſe of his function impracticable. He was committed to Newgate for writing againſt the revolution; and again, for carrying on a correſpondence which that change of events made treaſonable; but was releaſed both times, without trial, by the intervention of friends. It is obſervable that he carried his ſcruples ſo far, as to prefer confinement to the tacit acknowledgment of the juriſdiction of the court by accepting his liberty upon bail. Suitable to theſe principles, he next acted a very extraordinary part with two other clergymen of his own way of thinking, at the execution of Sir John Friend and Sir William Perkins for the aſſaſſination plot; by giving them ſolemn abſolution, and by impoſition of hands. Abſconding for which, he continued under an outlawry to the day of his death in 1726. Theſe proceedings having put a ſtop to his activity, he employed his retired hours rather more uſefully in literary works. In 1698, he attempted to reform our theatrical entertainments, by publiſhing his "Short view of the immorality and profaneneſs of the Engliſh ſtage," which engaged him in a controverſy with the wits of the time; but as Mr Collier defended his cenſures not only with wit, but with learning and reaſon, it is allowed that the decorum obſerved, for the moſt part, by ſucceeding dramatic writers, has been owing to his animadverſions. He next undertook a tranſlation of Morreri's great Hiſtorical and Geographical Dictionary; a work of extraordinary labour, and which appeared in 4 vols. folio. After this he publiſhed "An Eccleſiaſtical Hiſtory of Great Britain, chiefly of England," in 2 vols. folio; which is allowed to be written with great judgment, and even with impartiality. He was beſides engaged in ſeveral controverſies, which his conduct and writings gave riſe to, not material to mention. In Queen Anne's reign, Mr Collier was tempted, by offers of conſiderable preferment, to a ſubmiſſion; but as he was a nonjuror upon principle, he could not be brought to liſten to any terms.

Collier, or Coallier. See Coallier.

COLLIERY, Coalery, or Coalliery. See Coalery.

COLLINS, Anthony, a polemical writer, born at Heſten near Hounſlow in the county of Middleſex in 1676, was the ſon of Henry Collins, a gentleman of about 1500l. a-year. He was firſt bred at Eton college, and then went to King's-college Cambridge, where he had for his tutor Mr Francis Hare, afterwards biſhop of Chicheſter. He was afterwards a ſtudent of the Temple; but not reliſhing the law, ſoon abandoned that ſtudy. He was an ingenious man, and author of ſeveral curious books. His firſt remarkable piece was publiſhed in 1707, "An Eſſay concerning the uſe of reaſon in propoſitions, the evidence whereof depends on human teſtimony." In 1702, he entered into the controverſy between Mr Clark and Dr Dodwell, concerning the immortality of the ſoul. In 1713, he publiſhed his diſcourſe on free-thinking, which made a prodigious noiſe. In 1725, he retired into the county of Eſſex, and acted as a juſtice of peace and deputy lieutenant for the ſame county, as he had done before for that of Middleſex and liberty of Weſtminſter. The ſame year, he publiſhed a "Philoſophical Eſſay concerning human liberty." In 1718, he was choſen treaſurer of the county of Eſſex; and this office he diſcharged with great honour. In 1724, he publiſhed his "Hiſtorical and critical Eſſay on the 39 Articles." Soon after, he publiſhed his "Diſcourſe of the Grounds and reaſons of the Chriſtian religion;" to which is prefixed, "An Apology for free debate and liberty of writing;" which piece was immediately attacked by a great number of authors. In 1726 appeared his "Scheme of literary prophecy conſidered, in a view of the controverſy occaſioned by a late book entitled, A diſcourſe of the grounds, &c." In this diſcourſe he mentions a MS. diſſertation of his, to ſhow the Sibylline oracles to be a forgery made in the times of the primitive Chriſtians, who, for that reaſon, were called *Sibylliſts* by the Pagans; but it never appeared in print. His ſcheme of literary prophecy was replied to by ſeveral writers; and particularly by Dr John Rogers, in his "Neceſſity of divine revelation aſſerted." In anſwer to which our author wrote, "A letter to the Reverend Dr Rogers, on occaſion, &c." His health began to decline ſome years before his death, and he was very much afflicted with the ſtone, which at laſt put an end to his life at his houſe in Harley ſquare in 1729. He was interred in Oxford chapel, where a monument was erected to him, with an epitaph in Latin. His curious library was open to all men of letters, to whom he readily communicated all the aſſiſtance in his power; he even furniſhed his antagoniſts with books to confute himſelf, and directed them how to give their arguments all the force of which they were capable. He was remarkably averſe to all indecency and obſcenity of diſcourſe; and was, independent of his ſcepticiſm, a ſincerely good man.

Collins, *John*, an eminent accountant and mathematician, born in 1624, and bred a bookſeller at Oxford. Beſides ſeveral treatiſes on practical ſubjects, he communicated ſome curious papers to the Royal Society, of which he was a member, which are to be found in the early numbers of the Philoſophical Tranſactions: and was the chief promoter of many other ſcientifical publications in his time. He died in 1683; and about 25 years after, all his papers coming into the hands of the learned William Jones, Eſq. F. R. S. it appeared that Mr Collins held a conſtant correſpondence for many years with all the eminent mathematicians; and that many of the late diſcoveries in phyſical knowledge, if not actually made by him, were yet brought forth by his endeavours.

Collins, *William*, an admirable poet, was born

Collins.

at Chicheſter, about the year 1724. He received his claſſical education at Wincheſter, after which he ſtudied at New college, in Oxford, was admitted a commoner of King's college in the ſame univerſity, and was at length elected a demy of Magdalene college. While at Oxford, he applied himſelf to the ſtudy of poetry, and publiſhed his Oriental Eclogues, after which he came to London. He was naturally poſſeſſed of an ear for all the varieties of harmony and modulation; his heart was ſuſceptible of the fineſt feelings of tenderneſs and humanity, and was particularly carried away by that high enthuſiaſm which gives to imagination its ſtrongeſt colouring; and he was at once capable of ſoothing the ear with the melody of his numbers, of influencing the paſſions by the force of the pathos, and of gratifying the fancy by the luxury of deſcription. With theſe powers, he attempted lyric poetry; and in 1746, publiſhed his Odes, deſcriptive and allegorical; but the ſale of this work being not at all anſwerable to its merit, he burnt the remaining copies in indignation. Being a man of a liberal ſpirit and a ſmall fortune, his pecuniary reſources were unhappily ſoon exhauſted; and his life became a miſerable example of neceſſity, indolence, and diſſipation. He projected books which he was well able to execute; and became in idea an hiſtorian, a critic, and a dramatic poet; but wanted the means and encouragement to carry theſe ideas into execution. Day ſucceeded day, for the ſupport of which he had made no proviſion; and he was obliged to ſubſiſt, either by the repeated contributions of a friend or the generoſity of a caſual acquaintance. His ſpirits became oppreſſed, and he ſunk into a ſullen deſpondence. While in this gloomy ſtate of mind, his uncle Colonel Martin died, and left him a conſiderable fortune. But this came too late for enjoyment; he had been ſo long haraſſed by anxiety and diſtreſs that he fell into a nervous diſorder, which at length reduced the fineſt underſtanding to the moſt deplorable childiſhneſs. In the firſt ſtages of this diſorder he endeavoured to relieve himſelf by travelling, and paſſed into France; but the growing malady obliged him to return; and having continued, with ſhort intervals, in this pitiable ſtate till the year 1756, he died in the arms of his ſiſter.

The following character of the poetry of Collins is drawn by Mrs Barbauld, and is extracted from an eſſay prefixed to an edition of his works publiſhed in 1797. "He will be acknowledged to poſſeſs imagination, ſweetneſs, bold and figurative language. His numbers dwell on the ear, and eaſily fix themſelves in the memory. His vein of ſentiment is by turns tender and lofty, always tinged with a degree of melancholy, but not poſſeſſing any claim to originality. His originality conſiſts in his manner, in the highly figurative garb in which he clothes abſtract ideas, in the felicity of his expreſſions, and his ſkill in embodying ideal creations. He had much of the myſticiſm of poetry, and ſometimes became obſcure, by aiming at impreſſions ſtronger than he had clear and well-defined ideas to ſupport. Had his life been prolonged, and with life had he enjoyed that eaſe which is neceſſary for the undiſturbed exerciſe of the faculties, he would probably have riſen far above moſt of his contemporaries.

Collinſon.

COLLINSON, Peter, an eminent naturaliſt and antiquarian, deſcended of an ancient family, was born on the paternal eſtate called *Hugal Hall*, or *Height of Hugal*, near Windermere lake, in the pariſh of Stavely, about 10 miles from Kendal in Weſtmorland. Whilſt a youth, he diſcovered his attachment to natural hiſtory. He began early to make a collection of dried ſpecimens of plants, and had acceſs to the beſt gardens at that time in the neighbourhood of London. He became early acquainted with the moſt eminent naturaliſts of his time; the Drs Derham, Woodward, Hale, Lloyd, and Sloane, were amongſt his friends. Among the great variety of articles which form that ſuperb collection, now (by the wiſe diſpoſition of Sir Hans and the munificence of parliament) the Britiſh Muſeum, ſmall was the number of thoſe with whoſe hiſtory Mr Collinſon was not well acquainted; he being one of thoſe few who viſited Sir Hans at all times familiarly; their inclinations and purſuits in reſpect to natural hiſtory being the ſame, a firm friendſhip had early been eſtabliſhed between them. Peter Collinſon was elected a fellow of the Royal Society on the 12th of December 1728; and perhaps was one of the moſt diligent and uſeful members, not only in ſupplying them with many curious obſervations himſelf, but in promoting and preſerving a moſt extenſive correſpondence with learned and ingenious foreigners, in all countries and on every uſeful ſubject. Beſides his attention to natural hiſtory, he minuted every ſtriking hint that occurred either in reading or converſation; and from this ſource he derived much information, as there were very few men of learning and ingenuity who were not of his acquaintance at home; and moſt foreigners of eminence in natural hiſtory, or in arts and ſciences, were recommended to his notice and friendſhip. His diligence and economy of time were ſuch, that though he never appeared to be in a hurry, he maintained an extenſive correſpondence with great punctuality; acquainting the learned and ingenious in diſtant parts of the globe with the diſcoveries and improvements in natural hiſtory in this country, and receiving the like information from the moſt eminent perſons in almoſt every other. His correſpondence with the ingenious Cadwallader Colden, Eſq. of New-York, and the juſtly celebrated Dr Franklin of Philadelphia, furniſh inſtances of the benefit reſulting from his attention to all improvements. The latter of theſe gentlemen communicated his firſt eſſays on electricity to Mr Collinſon, in a ſeries of letters, which were then publiſhed, and have been reprinted in a late edition of the Doctor's ingenious diſcoveries and improvements. Perhaps, in ſome future period, the account procured of the management of ſheep in Spain, publiſhed in the Gentleman's Magazine for May and June 1764, may not be conſidered among the leaſt of the benefits accruing from his extenſive and inquiſitive correſpondence. His converſation, cheerful and uſefully entertaining, rendered his acquaintance much deſired by thoſe who had a reliſh for natural hiſtory, or were ſtudious in cultivating rural improvements; and ſecured him the intimate friendſhip of ſome of the moſt eminent perſonages in this kingdom, as diſtinguiſhed by their taſte in planting and horticulture, as by their rank and dignity. He was the firſt who introduced the great variety of ſeeds and ſhrubs which are now the principal ornaments of every garden; and it was owing to his indefatigable induſtry, that ſo many perſons of the firſt diſtinction are now enabled to behold groves tranſplanted from the weſtern continent flouriſhing as luxuriantly in their ſeveral domains as if they were already become indigenous to Britain. He had ſome correſpondents in almoſt every nation in Europe, ſome in Aſia, and even at Pekin; who all tranſmitted to him the moſt valuable ſeeds they could collect, in return for the treaſures of America. The great Linnæus, during his reſidence in England, contracted an intimate friendſhip with Mr Collinſon, which was reciprocally increaſed by a multitude of good offices, and continued to the laſt. Beſides his attachment to natural hiſtory, he was very converſant in the antiquities of our own country, having been elected a member of the Society of Antiquaries April 7. 1737; and he ſupplied them often with many curious articles of intelligence and obſervation, reſpecting both our own and other countries. He died in 1768, leaving behind him many materials for the improvement of natural hiſtory.

COLLINSONIA. See Botany *Index*.

COLLIQUAMENTUM, in *Natural Hiſtory*, an extreme tranſparent fluid in an egg, obſervable after two or three days incubation, containing the firſt rudiments of the chick. It is included in one of its own proper membranes, diſtinct from the albumen. Harvey calls it the *oculus*.

COLLIQUATION, in *Chemiſtry*, is applied to animal, vegetable, and mineral ſubſtances, tending towards fuſion. See Fusion.

Colliquation, in *Phyſic*, a term applied to the blood, when it loſes its craſis or balſamic texture; and to the ſolid parts, when they waſte away, by means of the animal fluids flowing off through the ſeveral glands, and particularly thoſe of the ſkin, faſter than they ought; which occaſions fluxes of many kinds, but moſtly profuſe, greaſy, aud clammy ſweats.

COLLIQUATIVE fever, in *Phyſic*, a fever attended with a diarrhœa, or with profuſe ſweats.

COLLISION, the ſtriking of one hard body againſt another; or the friction or percuſſion of bodies moving violently with different directions, and daſhing againſt each other, as flint and ſteel.

COLLUM, the ſame with Neck.

COLLUSION, in *Law*, a ſecret underſtanding between two parties, who plead or proceed fraudulently againſt each, to the prejudice of a third perſon.

COLLUTHIANS, a religious ſect who roſe about the beginning of the fourth century, on occaſion of the indulgence ſhown to Arius by Alexander, patriarch of Alexandria. Several people being ſcandalized at ſo much condeſcenſion; and, among the reſt, Colluthus, a prieſt of the ſame city, he hence took a pretence for holding ſeparate aſſemblies, and by degrees proceeded to the ordination of prieſts as if he had been a biſhop, pretending a neceſſity for this authority in order to oppoſe Arius. To his ſchiſm he added hereſy, teaching, that God did not create the wicked; that he was not author of the evils that befal men, &c. He was condemned by a council held at Alexandria by Oſius, in the year 330.

COLLYBUS (Κολλυβος), in antiquity, the ſame with what is now called *the rate of exchange*.

COLLYRÆ, or Collyrides, in antiquity, a certain ornament of hair, worn by the women on their necks. It was made up in the form of the ſmall roundiſh cakes called κολλυραι, *collyræ*.

COLLYRIDIANS, in church-hiſtory, a ſect, towards the cloſe of the 4th century, denominated from a little cake, called by the Greeks κολλυριδιαι, *collyridia*, which they offered to the Virgin Mary.

This ſect, it ſeems, conſiſted chiefly of Arabian women, who, out of an extravagance of devotion to the Virgin, met on a certain day in the year, to celebrate a ſolemn feaſt, and to render divine honours to Mary as to a goddeſs, eating the cake which they offered in her name. St Epiphanius, who relates the hiſtory of this ſuperſtitious ceremony, ridicules it. They ſprung up in oppoſition to the Antidico-Marianites.

COLLYRIUM, in *Pharmacy*, a topical remedy for a diſorder of the eyes, deſigned to cool and repel hot ſharp humours.

COLMAN, George, a miſcellaneous and theatrical writer, was born at Florence about the year 1733. He was the ſon of Mr Colman, at that time Britiſh reſident at the court of the duke of Tuſcany, and of a ſiſter of the counteſs of Bath. He received the early part of his education at Weſtminſter ſchool, where Lloyd, Churchill, Bonnel, Thornton, and ſome others who became afterwards diſtinguiſhed literary characters, were among his intimate companions. While at ſchool he appeared in the character of a poet, having addreſſed a copy of verſes to his couſin Lord Pulteney, which were afterwards publiſhed in the magazine of St James. He was next ſent to Chriſt Church College, Oxford, where he gave many proofs of his lively genius, uniting with Thornton in producing a weekly periodical paper, entitled the "Connoiſſeur," which was continued from January 1754, to September 1756, and afterwards publiſhed in 4 vols 12mo. Although this work met not with an equal ſhare of approbation with the World, the Adventurer, and the Rambler, which made their appearance much about the ſame time, yet it may with juſtice be affirmed, that ſome papers of it are ſuperior to any which theſe performances contain, for a ludicrous delineation of the current manners, which has always been conſidered as an eſſential department of every periodical work. When Mr Colman took the degree of A. M. he left the college, and reſided in London. He entered at Lincoln's-Inn, and in proper time was admitted to the bar; but literary purſuits were much more conſonant to the bent of his genius. He publiſhed in 1760 a dramatic piece of great humour, called *Polly Honeycombe*, which was ſucceſsfully acted in Drury-Lane; and the following year he gave the world his comedy of the Jealous Wife, deemed the beſt which had for many years appeared. By the demiſe of Lord Bath he came to the poſſeſſion of a handſome fortune, and it was farther augmented by the death of General Pulteney, in 1767. He ſtill continued to write for the ſtage, and produced, along with Garrick, that excellent comedy call the Clandeſtine Marriage. He alſo tranſlated the comedies of Terence into a kind of blank verſe, which gained him conſiderable applauſe.

He ſoon after this made a purchaſe of Haymarket theatre from Mr Samuel Foote, which he ſupplied with pieces either original or tranſlations, and ſelected the ableſt actors, particularly in comedy. To a tranſlation he made of Horace's Art of Poetry, he prefixed an ingenious account of the intention of its author; and added importance to the whole work by many critical notes. The Genius, and the Gentleman, were other two of his performances, as alſo a number of ſmall pieces of the humorous kind. His underſtanding was much impaired by a ſtroke of the palſy, which ſeized him in the year 1789, in conſequence of which melancholy event, his ſon was intruſted with the management of the theatre. He died in the month of Auguſt 1794, in the 62d year of his age.

COLMAR, a conſiderable town of France, in Upper Alſace, of which it is the capital. It has great privileges, and the Proteſtants have liberty of conſcience. It is ſeated near the river Ill, in E. Long. 7. 27. N. Lat. 48. 5.

COLMARS, a town of France in Provence, and the dioceſe of Sens. It is ſeated near the Alps, in E. Long. 6. 35. N. Lat. 44. 7.

COLMOGOROD, a town of the empire of Ruſſia, with an archbiſhop's ſee, ſeated in an iſland formed by the river Dwina, in E. Long. 39. 42. N. Lat. 64. 14.

COLNBROOK, a town of Buckinghamſhire in England, ſeated on the river Coln, which ſeparates this county from Middleſex. It is a great thoroughfare on the weſtern road, and has ſeveral good inns. W. Long. 0. 25. N. Lat. 51. 30.

COLNE, a town of Lancaſhire in England, ſeated on a ſmall hill near the confines of the county. W. Long. 2. 5. N. Lat. 53. 50.

COLOCHINA, an ancient town of the Morea, in Turkey in Europe. E. Long. 23. 22. N. Lat. 36. 32.

COLOCYNTHIS, in *Botany*, a ſpecies of Cucumis.

COLOCZA, a town of Hungary, ſeated on the Danube, and capital of the county of Bath, with an archbiſhop's ſee. It was taken by the Turks in 1686, but afterwards retaken by the Imperialiſts. E. Long. 18. 29. N. Lat. 46. 38.

COLOGNA, a town of Italy, in Padua, and in the territory of Venice. E. Long. 17. 27. N. Lat. 45. 14.

COLOGNE, The Archbishopric or Diocese of, one of the ſtates that compoſe the electoral circle of the Rhine, in Germany. It is bounded on the north by the duchy of Cleves and Gueldres, on the weſt by that of Juliers, on the ſouth by the archbiſhopric of Cleves, and on the eaſt by the duchy of Berg, from which it is almoſt wholly ſeparated by the Rhine. This country is very fruitful in corn and wine, which the inhabitants diſpoſe of by embarking it on the Rhine, it extending above ſeventy miles along that river. It is divided into the Higher and Lower Dioceſe: the Higher Dioceſe contains that part which lies above Cologne, wherein is Bonne, the capital town of this electorate, and where the elector reſides; beſides which there are Leichnich, Andernach, Bruyl, Zulich, and Kerpen. The Lower Dioceſe is on the other ſide of Cologne, and contains the towns of Zonz, Neuys, Heizarwart, Kempen, Rhynberg, and Alpen. The city of Cologne and county of Meurs, though within the dioceſe of Cologne, do not belong to it; for Cologne is a free city, and Meurs belongs to the houſe of Naſſau Orange; but by way of recompenſe, the elector has conſiderable dominions in Weſtphalia, which they call the *Domain*. It contains the duchy of Weſtphalia, and the county of Rechlinchuſen. This prelate is one of the electors of the empire, and holds alternately with that of Treves the ſecond or third rank in the electoral college. He is arch-chancellor of the empire in Italy, which dignity was very important when the emperors were maſters of Italy, but now it is next to nothing. When the emperors were crowned at Aix-la-Chapelle, the archbiſhop of Cologne performed the ceremony, which cauſed him to pretend to the ſame right elſewhere; but he was oppoſed by the archbiſhop of Mentz. This occaſioned an order, that they ſhould each of them have that honour in his own dioceſe, but if it was done elſewhere, they ſhould perform it alternately. The archbiſhop of Cologne is elected by the chapter in that city, which is the moſt illuſtrious in all Germany. They are all princes or counts, except eight doctors, who have no occaſion to prove their nobility.

Cologne, an ancient and celebrated town of Germany, in the dioceſe of that name, with an archbiſhop's ſee, and a famous univerſity, ſeated on the river Rhine, in E. Long. 7. 10. N. Lat. 50. 55. In the times of the Romans, this city was called *Colonia Agrippina*, and *Ubiorum*, becauſe it was built by Agrippina, the wife of Claudius I. and mother of Nero; and becauſe the Ubii inhabited this country on the Lower Rhine. In 755 it was an archbiſhopric, and in 1260 entered into the Hanſeatic league, which has now no exiſtence. The univerſity was eſtabliſhed in 1388 by Pope Urban VI. The city is fortified with ſtrong walls, flanked with 83 large towers, and ſurrounded with three ditches; but theſe fortifications, being executed after the ancient manner, could make but a poor defence at preſent. It lies in the ſhape of a half-moon, and is ſaid to have 20 gates, 19 pariſhes, 17 monaſteries, and 365 churches and chapels; but the ſtreets, in general, are dirty and badly paved, the windows of the houſes compoſed of ſmall bits of round glaſs, and the inhabitants are but few for ſo large a place. It is inhabited moſtly by Papiſts; but there are alſo many Proteſtants, who repair to the neighbouring town of Mulheim, in the duchy of Berg, for public worſhip. Its trade, which is conſiderable, eſpecially in Rheniſh wine, is chiefly in the hands of Proteſtants, and carried on by the Rhine. The ſhips with which they trade to the Netherlands are of a particular conſtruction, and conſiderable burden. The clergy here are very numerous, and have large revenues. That of the archbiſhop is 130,000l. Baron Polnitz ſays, that though Cologne is one of the greateſt cities, it is one of the moſt melancholy in all Europe; there being nothing to be ſeen but prieſts, friars, and ſtudents, many of whom beg alms with a ſong; and nothing to be heard but the ringing of bells; that there are very few families of quality; that the vulgar are very clowniſh; and that the noblemen of the chapter ſtay no longer in town than their duty obliges them. Mr Wright, in his travels, ſays, that the women go veiled; and that the beſt gin is that diſtilled from the juniper berries which grow in this neighbourhood. This city is perhaps the moſt remarkable of any in the world for the great number of precious relics it contains, of which the Popiſh clergy,

no

Cologne.

no doubt make their advantage. In the church of St Urſula, they pretend to ſhow her tomb, and the bones of the 11,000 pretended virgin martyrs, though that ſtory is entirely owing to a miſtaken inſcription. The heads of ſome of theſe imaginary martyrs are kept in caſes of ſilver, others are covered with ſtuffs of gold, and ſome have caps of cloth of gold and velvet. Brevat ſays, he ſaw between 4000 and 5000 ſkulls, decked with garlands, and coronets, ranged on ſhelves. The canoneſſes of St Urſula, who muſt be all counteſſes, have a handſome income. In their church they pretend to ſhow three of the thorns of our Saviour's crown, and one of the veſſels which contained the water that he converted into wine at the marriage of Cana. In the church of St Gereon are 900 heads of Mooriſh cavaliers, ſaid to have been in the army of Conſtantine before it was converted, and to have been beheaded for refuſing to ſacrifice to idols. Every one of the heads has a cap of ſcarlet, adorned with pearls. In the magnificent cathedral of St Peter, the three wiſe men who came from the eaſt to viſit our Saviour, are ſaid to be interred. They lie in a large purple ſhrine ſpangled with gold, ſet upon a pedeſtal of braſs, in the midſt of a ſquare mauſoleum, faced within and without with marble and jaſper. It is opened every morning at nine o'clock, if two of the canons of the cathedral are preſent, when theſe kings or wiſe men are ſeen lying at full length, with their heads bedecked with a crown of gold garniſhed with precious ſtones. Their names, which are *Gaſper*, *Melchier*, and *Balthaſar*, are in purple characters on a little grate, which is adorned with an infinite number of large rich pearls and precious ſtones, particularly an oriental topaz as big as a pigeon's egg, and valued at above 30,000 crowns. Over againſt them are ſix large branches of ſilver, with wax candles, which burn night and-day. The bones of theſe men, we are told, were brought to Conſtantinople by Helena mother to Conſtantine, from thence to Milan by Euſtorpius biſhop of that ſee, and afterwards hither by Archbiſhop Rainold. In the Jeſuits college are the portraits of the firſt 13 generals of that order, with Ignatius Loyola at their head; and in the church, which is the fineſt in Cologne, are many rich ſtatues, with an amazing quantity of fine ſilver plate; and the utenſils for maſs are all of gold enriched with precious ſtones. In the Cordeliers church, is the tomb of the famous Duns Scotus, ſurnamed *Doctor Subtilis*, with this epitaph, "Scotia me genuit, Anglia me ſuſcepit, Gallia me docuit, Colognia me tenet." Cologne is a free imperial city, and as ſuch has a ſeat and voice at the diets of the empire, and circle of the Lower Rhine. In thoſe of the empire, it has the firſt place on the Rheniſh bench. Towards the defence of the empire, its aſſeſſment is 825 florins; and towards the maintenance of the chamber-court, 405 rix-dollars 72½ kruitzers, each term. Its militia conſiſts of four companies of foot, who keep guard at the gates. It is governed by its own ſenate, in reſpect to civil matters and cauſes; but the criminal juriſdiction belongs to the elector and his chapter; and ſo jealous are the inhabitants of him, that they will not permit him to ſtay in the city above three days at a time, nor to come into it with a large retinue. For this reaſon the elector reſides commonly at Bonn. Cologne ſurrendered to the Fench in 1794.

Cologne-Earth
‖
Colon.

Cologne-*Earth*, a kind of very light baſtard ochre, of a deep brown colour.

COLOMBO, a handſome, pleaſant, and ſtrong town of Aſia, ſeated on the eaſtern ſide of the iſland of Ceylon in the Eaſt Indies. It was built by the Portugueſe in 1638; and in 1658 they were driven from it by the natives, aſſiſted by the Dutch, who are now in poſſeſſion of it. It is about three quarters of a mile long, and as much in breadth. The natives live in the old town, without the walls of the new; the ſtreets of this laſt are wide and ſpacious; and the buildings are in the modern taſte, particularly the governor's houſe, which is a handſome ſtructure. E. Long. 80. 25. N. Lat. 7. 10.

COLOMEY, or Colomia, a town of Poland in Red Ruſſia, ſeated on the river Pruth, in E. Long. 25. 9. N. Lat. 48. 45.

COLOMNA, Fabio, a very learned botaniſt, born at Naples about the year 1567. He became ſkilled in the languages, in muſic, deſigning, painting, and the mathematics; and died about the middle of the 17th century. He wrote, 1. Φυτοβασανος, ſeu Plantarum aliquot (ac piſcium) hiſtoria. 2. Minus cognitarum rariorumque ſtirpium ἐκφρασις; itemque de aquatilibus, aliiſque nonnullis animalibus, libellus; and other works.

COLON, in *Anatomy*, the firſt and moſt conſiderable of the large inteſtines. See Anatomy, N°. 194.

Colon, in *Grammar*, a point or character formed thus [:], ſerving to mark a pauſe, and to divide the members of a period. See Pointing; ſee alſo Period, Comma, and Semicolon. Grammarians generally aſſign the uſe of a colon to be, to mark the middle of a period; or to conclude a ſenſe leſs perfect than the dot or period:—but, a ſenſe leſs perfect than the period, is an expreſſion extremely vague and indeterminate. See Period.

Others ſay, a colon is to be uſed when the ſenſe is perfect, but the ſentence not concluded; but neither is this over clear and expreſs.

A late author, in an ingenious diſcourſe, *De ratione interpungendi*, marks the office of the colon, and wherein it differs from the ſemicolon, &c. more preciſely. A colon, on his principles, ſerves to diſtinguiſh thoſe conjunct members of a ſentence, which are capable of being divided into other members; whereof one, at leaſt, is conjunct. Thus, in the ſentence, *As we cannot diſcern the ſhadow moving along the dial-plate, ſo the advances we make in knowledge are only perceived by the diſtance gone over*; the two members being both ſimple, are only ſeparated by a comma. In this, *As we perceive the ſhadow to have moved, but did not perceive it moving; ſo our advances in underſtanding, in that they conſiſt of ſuch minute ſteps, are only perceivable by the diſtance*;—the ſentence being divided into two equal parts, and thoſe conjunct ones, ſince they include others; we ſeparate the former by a ſemicolon, and the latter by commas. But in this, *As we perceive the ſhadow to have moved along the dial, but did not perceive it moving; and it appears the graſs has grown, though nobody ever ſaw it grow: ſo the advances we make in knowledge, as they conſiſt of ſuch minute ſteps,* *are only perceivable by the diſtance*—the advancement in knowledge is compared to the motion of a ſhadow, and the growth of graſs; which compariſon divides the ſentence into two principal parts: but ſince what is ſaid of the movement of the ſhadow, and likewiſe of the growth of graſs, contains two ſimple members, they are to be ſeparated by a ſemicolon; conſequently a higher pointing is required to ſeparate them from the other part of the ſentence, which they are oppoſed to: and this is a colon. See Punctuation.

COLONEL, in military matters, the commander in chief of a regiment, whether horſe, foot, or dragoons.

Skinner derives the word from colony, being of opinion, the chiefs of colonies, called *coloniales*, might give the name to chiefs of forces. In the French and Spaniſh armies, colonel is confined to the infantry and dragoons: the commanding officer of a regiment of horſe they uſually call *meſtre de camp*. Formerly, inſtead of colonel, the French uſed the word coronel; and this old ſpelling comes nearer to our common way of pronouncing the word *colonel*.

A colonel may lay any officer of his regiment in arreſt, but muſt acquaint the general with it; he is not allowed a guard, only a ſentry from the quarter-guard.

Colonel-Lieutenant, he who commands a regiment of guards, whereof the king, prince, or other perſon of the firſt eminence, is colonel. Theſe colonel-lieutenants have always a colonel's commiſſion, and are uſually general officers.

Lieutenant-Colonel, the ſecond officer in a regiment, who is at the head of the captains, and commands in the abſence of the colonel.

COLONIA, in *Ancient Geography*, a town of the Trinobantes, a little above Camelodunum. Now Colcheſter in Eſſex, according to Camden, who ſuppoſes it to take its name from the river Colne, and not that it was a colony; though others think Antonine's diſtance agrees with Sudbury.

Colonia Equeſtris, an ancient and noble colony on the Lacus Lemanus. It appears to be the work of Julius Cæſar, who ſettled there *Equites Limatenei*; and to this Lucan is thought to refer. By the Itinerary it is ſuppoſed to have ſtood between Lauſanne and Geneva, 12 miles from the laſt place by Peutinger's map, which directs to Nyon, placed in Cavo Lemano, according to Lucan's expreſſion, that is, a bay or cove of the lake. Its ancient name was *Noviodunum*, (Notitia Galliæ): hence its modern name.

Colonia Metallina, or *Metallinenſis*, a town of Luſitania, ſituated on the right or weſt ſide of the Anas, or Guadiana; but now on the left or eaſt ſide, from the river's ſhifting its bed or channel, and called Medelin, a town in Eſtremadura. W. Long. 6. 12. Lat. 38. 45.

Colonia Morinorum, a town of Belgica, thought to be Tarvenna, the capital of the Morini. Now Terrouen, a town of Artois. E. Long. 2. 15. Lat. 50. 37.

Colonia Norbenſis, or *Norba Cæſarea*. a town of Luſitania, to the ſouth of Trajan's bridge on the Tagus. Now *Alcantara*, in Eſtremadura. W Long. [illegible]. 10. N. Lat. 39. 10.

Colonia Trojana, (Antonine, Peutinger); a town of Belgica, ſurnamed alſo *Ulpia*, (Antonine); and *Triceſima*, from being the ſtation of the thirtieth legion, (Ammian). Now Kellen, a village of the duchy of Cleves, a mile from the Rhine.

Colonia Valentia, (Ptolemy, Livy); a town of the Hither Spain, on the Turias; deſtroyed by Pompey, (Salluſt); reſtored by Julius Cæſar. Still called Valencia, on the river Guadalaviar, in Valencia. W. Long. 35. Lat. 39. 20.

COLONNA, a town of Italy in the Campagna of Rome, 18 miles eaſtward of that city. E. Long 12. 56. N. Lat. 41. 55.

Colonna, *Pompey*, cardinal archbiſhop of Montreal in Sicily, and biſhop of a very great number of places, made a conſpicuous figure in the world. He was equally qualified to wear the cardinal's hat and the helmet, and experienced more than once the reverſes of fortune. Julius II. removed him from all his dignities; but Leo I. reſtored him, created him cardinal, and ſent him on ſeveral embaſſies. Clement VII. diveſted him of the purple, and again reſtored him to it. It was pretended he was obliged to him for his exaltation to the papal throne. The pope refuſing him ſome requeſt, he reproached him, ſaying, "That it was by his intereſt he had arrived at his dignity." The pope replied, "It is true, but let me be pope, and do not endeavour to be ſo yourſelf; for by acting as you do, you endeavour to diſpoſſeſs me of that you have raiſed me to." He died viceroy of Naples in 1532. He wrote ſome poems in praiſe of Iſabella Filamarini, in which he proteſts the chaſtity of his wiſhes. He wrote another work, *De laudibus mulierum*.

COLONNADE, in *Architecture*, a periſtyle of a circular figure; or a ſeries of columns diſpoſed in a circle, and inſulated within ſide.

A Polyſtile Colonnade, is that whoſe numbers of columns are too great to be taken in by the eye at a ſingle view. Such is the colonnade of the palace of St Peter's at Rome, conſiſting of 284 columns of the Doric order, each above four feet and a half diameter, all in Tiburtine marble.

COLONOS, in *Ancient Geography*, an eminence near Athens, whither Œdipus, after his baniſhment from Thebes, is ſaid to have retired; and hence it is that Sophocles calls the tragedy on the ſubject *Oedipus Coloneus*. A place ſacred to Neptune, and where ſtood an equeſtrian ſtatue of him. Here alſo ſtood Timon's tower; who, for his love of ſolitude, and hatred to mankind, was called *Miſanthropos*, (Pauſanias).

COLONSAY, one of the Hebrides or Weſtern Iſlands belonging to Scotland. It comprehends that of Orouſay, from which it is only ſeparated in time of flood, and both belong to the ſame proprietor, viz. Mr M'Neil. See Oronsay.

COLONUS, a huſbandman, or villager, who was bound to pay yearly a certain tribute, or at certain times of the year to plough ſome part of the lord's land; and from hence comes the world *clown*, who is called by the Dutch, *boor*.

COLONY, a company of people tranſplanted into a remote province in order to cultivate and inhabit it

We may diſtinguiſh three kinds of colonies. Firſt, thoſe ſerving to eaſe or diſcharge the inhabitants of a country, where the people are become too numerous, ſo that they cannot any longer conveniently ſubſiſt.

The ſecond are thoſe eſtabliſhed by victorious princes, and people in the middle of vanquiſhed nations, to keep them in awe and obedience.

The third may be called *colonies of commerce;* becauſe, in effect, it is trade that is the ſole occaſion and object thereof.

It was by means of the firſt kind of colonies that, ſome ages after the deluge, the eaſt firſt, and ſucceſſively all the other parts of the earth, became inhabited; and without mentioning any thing of the Phœnician and Grecian colonies, ſo famous in ancient hiſtory, it is notorious that it was for the eſtabliſhment of ſuch colonies, that, during the declenſion of the empire, thoſe torrents of barbarous nations, iſſuing, for the generality, out of the north, overran the Gauls, Italy, and the other ſouthern parts of Europe; and, after ſeveral bloody battles, divided it with the ancient inhabitants.

For the ſecond kind of colonies, the Romans uſed them more than any other people; and that to ſecure the conqueſts they had made from the weſt to the eaſt. It is well known how many cities in Gaul, Germany, Spain, and even England, value themſelves on their having been of the number of Roman colonies.

There were two kinds of colonies among the Romans: thoſe ſent by the ſenate; and the military ones, conſiſting of old ſoldiers, broken and diſabled with the fatigues of war, who were thus provided with lands as the reward of their ſervices. See Benefice. The colonies ſent by the ſenate were either Roman or Latin, i. e. compoſed either of Roman citizens or Latins. The Coloniæ Latinæ were ſuch as enjoyed the *jus Latii;* ſaid to conſiſt in thoſe two things: one, that whoever was edile or prætor in a town of Latium, became for that reaſon a Roman citizen; the other, that the Latins were ſubject to the edicts of their own and not to thoſe of the Roman magiſtrates: in the year of the city ſix hundred and ſixty two, after the Social war, the city was granted to all Latium, by the *lex Julia.* The coloniæ Romanæ, were ſuch as had the jus Romanum, but not in its full extent; namely, in the right of ſuffrage, putting up for honours, magiſtracies, command in the army, &c.; but the jus Quiritum only, or private right; as right of liberty, of gentility, or dignity of family, ſacrifice, marriage, &c. For it was long a rule, never to grant the liberty of the city in full to colonies; nor is there any inſtance to the contrary, till after the Social war, in the year of the city ſix hundred and ſixty-two. According to Ulpian (l. 1. *D. de Cenſ.*), there were other colonies, which had little more than the name, only enjoying what they called *jus Italicum,* i. e. they were free from the tributes and taxes paid by the provinces. Such were the colonies of Tyre, Berytus, Heliopolis, Palmyra, &c. M. Vaillant has filled a volume in folio with medals ſtruck by the ſeveral colonies, in honour of the emperors who founded them. The ordinary ſymbol they engraved on their medals, was either an eagle; as when the veteran legions were diſtributed in the colonies; or a labourer, holding a plough drawn by a pair of oxen; as when the colony conſiſted of ordinary inhabitants. On all the medals are ſeen the names of the decemviri, who held the ſame rank and had the ſame authority there as the conſuls had at Rome.

Laſtly, the colonies of commerce, are thoſe eſtabliſhed by the Engliſh, French, Spaniards, Portugueſe, and other nations, within theſe two laſt centuries, and which they continue ſtill to eſtabliſh, in ſeveral parts of Aſia, Africa, and America; either to keep up a regular commerce with the natives, or to cultivate the ground, by planting ſugar-canes, indigo, tobacco, and other commodities. The principal of this kind of colonies, are in the one and the other America, northern and ſouthern; particularly Peru, Mexico, Canada (lately Virginia, New-England, Carolina), la Louiſiana, l'Acadia, Hudſon's Bay, the Antilles iſlands, Jamaica, Domingo, and the other iſlands.—In Africa, Madagaſcar, Cape of Good Hope, Cape Verd, and its iſlands, and all thoſe vaſt coaſts extending thence as far as to the Red ſea. Laſtly, in Aſia, the famous Batavia of the Dutch; Goa, Diu, of the Portugueſe; and ſome other leſs conſiderable places of the Engliſh, French, and Danes.

The practice of ſettling commercial colonies in diſtant countries hath been adopted by the wiſeſt nations of antiquity, who acted ſyſtematically upon maxims of ſound policy. This appears to have been the caſe with the ancient Egyptians, the Chineſe, the Phœnicians, the commercial ſtates of Greece, the Carthaginians, and even the Romans; for though the colonies of the latter were chiefly military, it could eaſily be ſhown that they were likewiſe made uſe of for the purpoſes of trade. The ſavage nations who ruined the Roman empire, ſought nothing but to extirpate or hold in vaſſalage thoſe whom they overcame; and therefore, whenever princes enlarged their dominions at the expence of their neighbours, they had recourſe to ſtrong forts and garriſons to keep the conquered in awe. For this they have been blamed by the famous Machiavel, who labours to ſhow, that the ſettling of colonies would have been a cheaper and better method of bridling conquered countries, than building fortreſſes in them. John de Witt, who was one of the ableſt and beſt ſtateſmen that ever appeared, ſtrongly recommended colonies; as affording a refuge to ſuch as had been unfortunate in trade; as opening a field for ſuch men to exert their abilities, as through want of intereſt could not raiſe themſelves in their own country; and as a ſupplement to hoſpitals and other charitable foundations, which he thought in time might come to be overcharged. Some, however, have ridiculed the ſuppoſed advantages of colonies, and aſſerted that they muſt always do miſchief by depopulating the mother-country.

The hiſtory of the Britiſh colonies, undoubtedly ſhows, that when coloniſts become numerous and opulent, it is very difficult to retain them in proper ſubjection to the parent ſtate. It becomes then a queſtion not very eaſily anſwered, how far they are entitled to the rights they had as inhabitants of the mother-country, or how far they are bound by its laws? On this ſubject Mr Blackſtone hath the following obſervations.

“ Plantations, or colonies in diſtant countries, are either ſuch where the lands are claimed by right of occupancy only, by finding them deſert and uncultivated, and peopling them from the mother-country; or where, when already cultivated, they have either been gained by conqueſt, or ceded to us by treaties. And both the rights are founded upon the law of nature, or at leaſt on that of nations. But there is a difference between theſe two ſpecies of colonies with reſpect to the laws by which they are bound. For it hath been held, that if an uninhabited country be diſcovered and planted by Engliſh ſubjects, all the Engliſh laws then in being, which are the birthright of every ſubject, are immediately there in force. But this muſt be underſtood with many and very great reſtrictions. Such coloniſts carry with them only ſo much of the Engliſh law as is applicable to their own ſituation, and the condition of an infant colony; ſuch, for inſtance, as the general rules of inheritance, and of protection from perſonal injuries. The artificial refinements and diſtinctions incident to the property of a great and commercial people, the laws of policy and revenue (ſuch eſpecially as are enforced by penalties), the mode of maintenance for the eſtabliſhed clergy, the juriſdiction of ſpiritual courts, and a multitude of other proviſions, are neither neceſſary nor convenient for them, and therefore are not in force. What ſhall be admitted, and what rejected, at what times, and under what reſtrictions, muſt, in caſes of diſpute, be decided in the firſt inſtance by their own provincial judicature, ſubject to the reviſion and controul of the king in council; the whole of their conſtitution being alſo liable to be new-modelled and reformed by the general ſuperintending power of the legiſlature in the mother-country. But in conquered or ceded countries, that have already laws of their own, the king may indeed alter and change thoſe laws; but, till he does actually change them, the ancient laws of the country remain, unleſs ſuch as are againſt the law of God, as in an infidel country. Our American plantations are principally of this latter ſort, being obtained in the laſt century, either by right of conqueſt and driving out the natives (with what natural juſtice I ſhall not at preſent inquire), or by treaties. And therefore, the common law of England, as ſuch, has no allowance or authority there; they being no part of the mother-country, but diſtinct (though dependent) dominions. They are ſubject, however, to the controul of the parliament; though (like Ireland, Mann, and the reſt) not bound by any acts of parliament, unleſs particularly named."

With reſpect to their interior polity, our colonies, whether thoſe we formerly poſſeſſed or ſtill poſſeſs, may be diſtinguiſhed into three ſorts. 1. Provincial eſtabliſhments, the conſtitutions of which depend on the reſpective commiſſions iſſued by the crown to the governors, and the inſtructions which uſually accompany thoſe commiſſions; under the authority of which provincial aſſemblies are conſtituted, with the power of making local ordinances not repugnant to the laws of Britain. 2. Proprietary governments, granted out by the crown to individuals, in the nature of feudatory principalities, with all their inferior regalities, and ſubordinate powers of legiſlation, which formerly belonged to the owners of counties palatine; yet ſtill with theſe expreſs conditions, that the ends for which the grant was made be ſubſtantially purſued, and that nothing be attempted which may derogate from the ſovereignty of the mother-country. 3. Charter governments, in the nature of civil corporations; with the power of making bye-laws for their own interior regulation, not contrary to the laws of Britain; and with ſuch rights and authorities as are ſpecially given them in their ſeveral charters of incorporation. The form of government, in moſt of them, is borrowed from that of England. They have a governor named by the king (or, in ſome proprietary colonies, by the proprietor), who is repreſentative or deputy. They have courts of juſtice of their own, from whoſe deciſions an appeal lies to the king in council here in England. Their general aſſemblies, which are their houſe of commons, together with their council of ſtate, being their upper houſe, with the concurrence of the king, or his repreſentative the governor, make laws ſuited to their own emergencies. But it is particularly declared, by ſtat. 7 and 8 W. III. c. 22. that all laws, bye-laws, uſuages, and cuſtoms, which ſhall be in practice in any of the plantations, repugnant to any law made or to be made in this kingdom relative to the ſaid plantations, ſhall be utterly void and of none effect. And, becauſe ſeveral of the colonies had claimed the ſole and excluſive right of impoſing taxes upon themſelves, the ſtatute 6 Geo. III. c. 12. expreſsly declares, that all his majeſty's colonies in America, have been, are, and of right ought to be, ſubordinate to and dependent upon the imperial crown and parliament of Great Britain, who have full power and authority to make laws and ſtatutes of ſufficient validity to bind the colonies and people of America, ſubjects to the crown of Great Britain in all caſes whatſoever. And the attempting to enforce this by other acts of parliament, penalties, and at laſt by military power, gave riſe, as is well known, to the late revolt and final ſeparation of thirteen colonies. See the article America. This country is now detached from Britain, and conſiſts of 13 independent ſtates, ſometimes denominated the United Provinces.

COLOPHON, in *Ancient Geography*, a town of Ionia, in the Hither Aſia, on a promontory on the Egean ſea, and waſhed by the Haleſus. The ancient Colophon was deſtroyed by Lyſimachus, in his war with Antigonus, in order to enlarge Epheſus. Pauſanias ſays, it was rebuilt in the neighbourhood, in a more commodious ſcite. This was one of the cities that laid claim to Homer. *Colophonem addere*, a proverbial ſaying, explained by Strabo to denote, that the Colophonian horſe turned the ſcales in favour of the ſide on which they fought. The Colophonians had a grove, a temple, and an oracle of Apollo Clarius (Strabo). Of this town was the poet Antimachus, remarked on for his turgid ſtyle by Catullus. He wrote a life of Homer, whom he makes a Colophonian (Plutarch).

COLOPHONY, in *Pharmacy*, black reſin, or turpentine, boiled in water, and afterwards dried; or, which is ſtill better, the caput mortuum remaining after the diſtillation of the ethereal oil, being further urged by a more intenſe and long continued fire.—It receives its name of *colophonia*, from Colophon, a city of Ionia, becauſe the beſt was formerly brought from thence. Two ſorts are mentioned in ancient writings;

the one dry, the other in a liquid ſtate. The latter ſeems to have been liquid pitch, which is the crude reſin of the pine brought from Colophon ; the other was called *reſina fricta*, and conſiſted only of the former deprived of its humid parts.

COLOQUINTIDA, in *Botany*. See Cucumis.

COLORATURA, in *Muſic*, denotes all manner of variations, trillos, diminutions &c. ſerving to make a ſong agreeable.

COLORNO, a town of Italy, in the Parmaſan, near the river Po, eight miles from Parma. The duke of Parma has a pleaſure-houſe here, one of the moſt delightful ſeats in all Italy, and the gardens are very fine. E. Long. 9. 15. N. Lat. 44. 54.

COLOSSÆ, or Coloseæ, in *Ancient Geography*, a conſiderable town of Phrygia Magna, in which the Lycus falls into a gulf, and at the diſtance of five ſtadia emerges again, and runs into the Meander (Herodotus). Others ſay, the genuine name is *Coloſſæ*, and the people *Coloſſenſes*, to whom St Paul wrote an epiſtle : Strabo calls them *Coloſſeni*. In Nero's time the town was deſtroyed by an earthquake (Oroſius).

COLOSSUS, a ſtatue of enormous or gigantic ſize. The moſt eminent of this kind was the coloſſus of Rhodes, a ſtatue of Apollo, ſo high, that ſhips paſſed with full ſails betwixt its legs. It was the workmanſhip of Chares, a diſciple of Lyſippus, who ſpent 12 years in making it : it was at length overthrown by an earthquake, after having ſtood 1360 years. Its height was ſix ſcore and ſix feet : there were few people who could fathom its thumb, &c. When the Saracens became poſſeſſed of the iſland, the ſtatue was found proſtrate on the ground : they ſold it to a Jew, who loaded 900 camels with the braſs.

The baſis that ſupported it was a triangular figure ; its extremities were ſuſtained with 60 pillars of marble. There was a winding ſtaircaſe to go up to the top of it, from whence one might diſcover Syria, and the ſhips that went into Egypt, in a great looking-glaſs, that was hung about the neck of the ſtatue. Among the antiquities of Rome, there are ſeven famous coloſſuſes ; two of Jupiter, as many of Apollo, one of Nero, one of Domitian, and one of the Sun.

COLOSTRUM, the firſt milk of any animal after bringing forth young, called in ſome places *beeſtings*. It is remarkable that this milk is generally cathartic, and purges the meconium ; thus ſerving both as an aliment and medicine.

An emulſion prepared with turpentine diſſolved with the yolk of an egg, is ſometimes called by this name.

COLOSWAR, a large and celebrated town of Tranſylvania, where the ſenates have their meetings. It is ſeated on the river Samos, in E. Long. 21. 35. N. Lat. 46. 53.

COLOUR, in *Phyſics*, a property inherent in light, by which, according to the various ſizes of its parts, or from ſome other cauſe, it excites different vibrations in the optic nerve ; which propagated to the ſenſorium, affect the mind with different ſenſations. See Chromatics and Optics.

Colour, in *Painting*, is applied both to the drugs, and to the tints produced by thoſe drugs variouſly mixed and applied.

The principal colours uſed by painters are red and white lead, or ceruſe ; yellow and red ocres ; ſeveral kinds of earth, umbre, orpiment, lamp-black, burnt ivory, black lead, cinnabar or vermilion, gamboge, lacca, blue and green aſhes, verdigris, biſtre, bice, ſmalt, carmine, ultramarine : each of which, with their uſes, &c. are to be found under their proper articles.

Of theſe colours ſome are uſed tempered with gum-water, ſome ground with oil, others only in freſco, and others for miniature..

Painters reduce all the colours they uſe under theſe two claſſes, of dark and light colours : dark colours are black, and all others that are obſcure and earthy, as umbre, biſtre, &c.

Under light colours are comprehended white, and all that approach neareſt to it.

Painters alſo diſtinguiſh colours into ſimple and mineral.

Under ſimple colours they rank all thoſe which are extracted from vegetables, and which will not bear the fire ; as the yellow made of ſaffron, French berries, lacca, and other tinctures extracted from flowers, uſed by limners, illuminers, &c.

The mineral colours are thoſe which being drawn from metals, &c. are able to bear the fire, and therefore uſed by enamellers. Changeable and permanent colours is another diviſion, which, by ſome, is made of colours.

Changeable colours are ſuch as depend on the ſituation of the objects with reſpect to the eye, as that of a pigeon's neck, taffeties, &c. the firſt however, being attentively viewed by the microſcope, each fibre of the feathers appears compoſed of ſeveral little ſquares, alternately red and green, ſo that they are fixed colours.

Water-Colours, are ſuch as are uſed in painting with gum-water or ſize, without being mixed with oil.

Incapacity of diſtinguiſhing Colours. Of this extraordinary defect in viſion, we have the following inſtances in the Philoſophical Tranſactions for 1777. One of the perſons lived at Maryport in Cumberland. The account was communicated by Mr Huddart to Dr Prieſtley, and is as follows. “ His name was Harris, by trade a ſhoemaker. I had often heard from others, that he could diſcern the form and magnitude of all objects very diſtinctly, but could not diſtinguiſh colours. This report having excited my curioſity, I converſed with him frequently on this ſubject. The account he gave was this : That he had reaſon to believe other perſons ſaw ſomething in objects which he could not ſee ; that their language ſeemed to mark qualities with preciſion and confidence, which he could only gueſs at with heſitation, and frequently with error. His firſt ſuſpicion of this aroſe when he was about four years old. Having by accident found in the ſtreet a child's ſtocking, he carried it to a neighbouring houſe to inquire for the owner ; he obſerved the people called it a *red* ſtocking, though he did not underſtand why they gave it that denomination, as he himſelf thought it completely deſcribed by being called *a ſtocking*. This circumſtance, however, remained in his memory, and, together with ſubſequent obſervations, led him to the knowledge of his defect.

“ He alſo obſerved, that when young, other children could diſcern cherries on a tree, by ſome pretended difference of colour, though he could only diſtinguiſh them from the leaves by the difference of their ſize and ſhape. He obſerved alſo, that by means of this difference of colour they could ſee the cherries at a greater diſtance than he could, though he could ſee other objects at as a great a diſtance as they, that is, where the ſight was not aſſiſted by the colour. Large objects he could ſee as well as other perſons; and even the ſmaller ones if they were not enveloped in other things, as in the caſe of cherries among the leaves.

“ I believe he could never do more than gueſs the name of any colour; yet he could diſtinguiſh white from black, or black from any light or bright colour. Dove or ſtraw colour he called *white*, and different colours he frequently called by the ſame name; yet he could diſcern a difference between them when placed together. In general, colours of an equal degree of brightneſs, however they might otherwiſe differ, he confounded together. Yet a ſtripped ribbon he could diſtinguiſh from a plain one; but he could not tell what the colours were with any tolerable exactneſs. Dark colours, in general, he often miſtook for black; but never imagined white to be a dark colour, nor dark to be a white colour.

“ He was an intelligent man, and very deſirous of underſtanding the nature of light and colours; for which end he had attended a courſe of lectures in natural philoſophy.

“ He had two brothers in the ſame circumſtances as to ſight; and two other brothers and ſiſters, who, as well as their parents, had nothing of this defect.

“ One of the firſt mentioned brothers, who is now living, I met with at Dublin, and wiſhed to try his capacity to diſtinguiſh the colours in a priſm; but not having one by me, I aſked him, whether he had ever ſeen a rainbow? he replied, He had often, and could diſtinguiſh the different colours; meaning only, that it was compoſed of different colours, for he could not tell what they were.

“ I then procured and ſhowed him a piece of ribbon; he immediately, and without any difficulty, pronounced it a ſtriped, and not a plain, ribbon. He then attempted to name the different ſtripes: the ſeveral ſtripes of white he uniformly and without heſitation called white; the four black ſtripes he was deceived in; for three of them he thought brown, though they were exactly of the ſame ſhade with the other, which he properly called black. He ſpoke, however, with diffidence, as to all thoſe ſtripes; and it muſt be owned, that the black was not very diſtinct; the light green he called yellow; but he was not very poſitive; he ſaid, “ I think this is what you call yellow.” The middle ſtripe, which had a ſlight tinge of red, he called a ſort of blue. But he was moſt of all deceived by the orange colour, of which he ſpoke very confidently, ſaying, “ This is the colour of graſs, this is green.” I alſo ſhowed him a great variety of ribbons, the colour of which he ſometimes named rightly, and ſometimes as differently as poſſible from the true colour.

“ I aſked him, whether he imagined it poſſible for all the various colours he ſaw to be mere difference of light and ſhade; and that all colours could be compoſed of theſe two mixtures only? With ſome heſitation he replied, No, he did imagine there was ſome other difference.

“ It is proper to add, that the experiment of the ſtriped ribbon was made in the day-time, and in a good light.”

COLOURS for ſtaining different kinds of Stones. See CHEMISTRY.

COLOUR, in *Dyeing*. See DYEING.

COLOUR of Plants, is an attribute found to be very variable. Different colours are obſerved, not only in different individuals of the ſame ſpecies, but likewiſe in different parts of the ſame individual. Thus, marvel of Peru, and ſweet-william, have frequently petals of different colours on the ſame plant. Three or four different colours are frequently found upon the ſame leaf or flower, as on the leaves of the amaranthus tricolor, and the flowers of the tulip, auricula, three-coloured violet and others. To produce the moſt beautiful and ſtriking variety of colours in ſuch flowers, is the principal delight and buſineſs of the floriſt.

The primitive colours, and their intermediate ſhades or gradations enumerated by botaniſts, are as follow:

Water-colours, *hyalinus*.
WHITE.
Lead-colour, *cinereus*.
BLACK, *niger*.
Brown, *fuſcus*.
Pitch-black, *ater*.
YELLOW, *luteus*.
Straw-colour, *flavus*.
Flame-colour, *fulvus*.
Iron-colour, *gilvus*.
RED.
Fleſh-colour, *incarnatus*.
Scarlet, *coccineus*.
PURPLE.
Violet-colour, *cæruleo-purpureus*.
BLUE, *cæruleus*.
GREEN.

Theſe colours ſeem to be appropriated to particular parts of the plant. Thus, white is moſt common in roots, ſweet berries, and the petals of ſpring flowers. Water-colour, in the filaments and ſtyles. Black, in the roots and ſeeds; rarely in the ſeed-veſſel, and ſcarce ever to be found in the petals. Yellow is frequently in the antheræ or tops of the ſtamina; as likewiſe in the petals of autumnal flowers, and the compound legulated flowers of Linnæus. Red is common in the petals of ſummer flowers, and in the acid fruits. Blue and violet-colour, in the petals. Green, in the leaves and calyx, but rarely in the petals. In the interchanging of colours, which in plants is found to depend upon differences in heat, climate, ſoil, and culture, a ſort of elective attraction is obſerved to take place. Thus, red is more eaſily changed into white and blue; blue into white and yellow; yellow into white; and white into purple. A red colour is often changed into a white, in the flowers of heath, mother of thyme, betony, pink, viſcous campion, *cucubalus*, trefoil, orchis, fox glove, thiſtle, cudweed, ſaw-wort, roſe, poppy, fumitory, and geranium. Red paſſes into blue in pimpernel. Blue is changed into white in bell-flower, greek-valerian, bind-weed, columbine, violet vetch, milk-wort, goat's rue, viper's bugloſs, comfrey, borrage, hyſſop, dragon's head, ſcabious, blue-bottle, and ſuccory. Blue is changed into yellow in crocus. Yellow paſſes eaſily into white in melilot, agrimony, mullein, tulip, *blattaria*, or moth-mullein, and corn marigold. White is changed into purple in wood ſorrel, thorn-apple, peaſe, and daiſy.

Although plants are ſometimes obſerved to change their colour upon being moiſtened with coloured juices, yet that quality in vegetables ſeems not ſo much owing to the nature of their nouriſhment, as to the action of the internal and external air, heat, light, and the primitive organization of the parts. In ſupport of this opinion, we may obſerve with Dr Grew, that there is a far leſs variety in the colours of roots than of the other parts of the plant; the pulp within the ſkin, being uſually white, ſometimes yellow, rarely red. That this effect is produced by their ſmall intercourſe with the external air appears from this circumſtance, that the upper parts of roots, when they happen to ſtand naked above the ground, are often dyed with ſeveral colours: thus the tops of ſorrel roots turn red; thoſe of turnips, mullein, and radiſhes, purple; and many others green; whilſt thoſe parts of the ſame roots which lie more under ground are commonly white. The green colour is ſo proper to leaves, that many, as thoſe of ſage, the young ſprouts of St John's wort, and others which are reddiſh when in the bud, acquire a perfect green upon being fully expanded. In like manner, the leaves of the ſea-ſide grape, (*polygonum*), which when young are entirely red, become, as they advance in growth, perfectly green, except the middle and tranſverſe ribs, which retain their former colour.

As flowers gradually open and are expoſed to the air, they throw off their old colour, and acquire a new one. In fact, no flower has its proper colour till it is fully expanded. Thus the purple flock-julyflowers are white or pale in the bud. In like manner bachelor's buttons, blue-bottle, poppy, red daiſies, and many other flowers, though of divers colours when blown, are all white in the bud. Nay, many flowers change their colour thrice ſucceſſively; thus, the very young buds of lady's looking-glaſs, bugloſs, and the like, are all white; the larger buds purple, or murrey; and the open flowers blue.

With reſpect to the colours of the juices of plants, we may obſerve, that moſt reſinous gums are tinctured; ſome, however, are limpid; that which drops from the domeſtic pine is clear as rock-water. The milk of ſome plants is pale, as in burdock; of others white, as in dandelion, euphorbium, and ſcorzonera; and of others yellow, as in lovage, and greater celandine. Moſt mucilages have little colour, taſte, or ſmell. Of all the colours above enumerated, green is the moſt common to plants, black is the moſt rare.

Colour being a quality in plants ſo apt to change, ought never to be employed in diſtinguiſhing their ſpecies. Theſe ought to be characterized from circumſtances not liable to alteration by culture or other accidents. The ſame inconſtancy of colour obſerved in the flowers, is likewiſe to be found in the other parts of plants. Berries frequently change from green to red, and from red to white. Even in ripe fruit, the colour, whether white, red, or blue, is apt to vary; particularly in apple, pear, plum, and cherry trees. Seeds are more conſtant in point of colour than the veſſel which contains them. In the ſeeds, however, of the poppy, oats, pea, bean, and kidney-bean, variations are frequently obſerved. The root, too, although not remarkably ſubject to change, is found to vary in ſome ſpecies of carrot and radiſh. Leaves frequently become ſpotted, as in a ſpecies of orchis, hawk-weed, ranunculus, knot-graſs, and lettuce; but ſeldom relinquiſh their green colour altogether. Thoſe of ſome ſpecies of amaranthus, or flower-gentle, are beautifully coloured. The ſpots that appear on the ſurface of the leaves are of different colours, liable to vary, and not ſeldom diſappear altogether. The leaves of officinal lung-wort, and ſome ſpecies of ſow-bread, ſorrel, trefoil, and ranunculus, are covered with white ſpots. Thoſe of dog's-tooth violet, with purple and white. Thoſe of ſeveral ſpecies of ranunculus, and orchis with black and purple. Thoſe of amaranthus tricolor, with green, red, and yellow. Thoſe of ranunculus acris, and a ſpecies of bog-bean, with red or purple. The under ſurface of the leaves of ſome ſpecies of pimpernel and the ſea-plantain is marked with a number of dots or points; a white line runs through the leaves of Indian reed, black-berried heath, and a ſpecies of Canary graſs: and the margin or brim of the leaf, in ſome ſpecies of box, honeyſuckle, ground-ivy, and the evergreen oak, is of a ſilver-white colour. The whole plant is often found to aſſume a colour that is unnatural or foreign to it. The varieties in ſome ſpecies of eryngo, mug-wort, orrach, amaranthus, purſlane, and lettuce, furniſh examples.

Such being the inconſtancy of colour in all the parts of the plant, ſpecific names derived from that quality are very properly, by Linnæus, deemed erroneous; whether they reſpect the colour of the flower, fruit, ſeeds, root, leaves, or expreſs in general the beauty or deformity of the entire plant, with a particular view to that circumſtance. Of this impropriety, committed by former botaniſts, Linnæus himſelf is not always guiltleſs. Thus the two ſpecies of *ſarracena*, or the ſide-ſaddle flower, are diſtinguiſhed by the colour of their petals into the yellow and purple ſarracena; although the ſhapes and figure of the leaves afforded much more conſtant as well as ſtriking characters. The ſame may be ſaid of his lupinus albus and luteus; reſeda alba, glauca, and lutea; angelica atro-purpurea; dictamnus albus; lamium album; ſelago coccinea; ſida alba; paſſiflora rubra, lutea, incarnata, and cœrulea; and of many others, in which the ſpecific name is derived from a character or quality that is ſo liable to vary in the ſame ſpecies.

We ſhall conclude this article with obſerving, that of all ſenſible qualities, colour is the leaſt uſeful in indicating the virtues and powers of vegetables. The following general poſitions on this ſubject are laid down by Linnæus, and ſeem ſufficiently confirmed by experiment. A yellow colour generally indicates a bitter taſte; as in gentian, aloe, celandine, turmeric, and other yellow flowers. Red indicates an acid or ſour taſte; as in cranberries, barberries, currants, raſpberries, mulberries, cherries; the fruit of the roſe, ſea-buckthorn, and ſervice-tree. Herbs that turn red towards autumn, have likewiſe a ſour taſte; as ſorrel, wood-ſorrel, and bloody dock. Green indicates a crude alkaline taſte, as in leaves and unripe fruits. A pale colour denotes an inſipid taſte, as in endive, aſparagus, and lettuce. White promiſes a ſweet luſcious taſte; as in white currants and plums, ſweet apples, &c. Laſtly, black indicates a harſh, nauſeous, diſagreeable taſte; as in the berries of deadly nightſhade, myrtle-leaved ſumach, herb-chriſtopher, and others; many of which are not only unpleaſant to the taſte, but pernicious and deadly in their effects.

To be aſcertained of the acid or alkaline property of any plant, expreſs ſome of the juice, and rub it upon a piece of blue paper; which, if the plant in queſtion is of an acid nature, will turn red; if of an alkaline, green. For the methods of extracting colours from the different parts of plants, ſee the article *Colour-Making*.

Difference of Colour in the Human Species. See Complexion.

Colour, in *Heraldry*. The colours generally uſed in heraldry are, red, blue, black, green, and purple; which the heralds call *gules*, *azure*, *ſable*, *vert* or *ſinople*, and *purpure*; tenne, or tawny, and ſanguine, are not ſo common; as to yellow and white, called *or* and *argent*, they are metals, not colours.

The metals and colours are ſometimes expreſſed in blazon by the names of precious ſtones, and ſometimes by thoſe of planets or ſtars. See Blazoning.

Œnomaus is ſaid firſt to have invented the diſtinctions of colours, to diſtinguiſh the gundillæ of combatants at the Circenſian games; the green for thoſe who repreſented the earth, and blue for thoſe who repreſented the ſea.

Colours, in the military art, include the banners, flags, enſigns, &c. of all kinds, borne in the army or fleet. See Flag and Standard.

Colours, in the Latin and Greek churches, are uſed to diſtinguiſh ſeveral myſteries and feaſts celebrated therein.

Five colours only are regularly admitted into the Latin church: theſe are white, green, red, violet, and black. The white is for the myſteries of our Saviour, the feaſt of the Virgin, thoſe of the angels, ſaints, and confeſſors: the red is for the myſteries and ſolemnities of the holy ſacrament, the feaſts of the apoſtles and martyrs; the green for the time between pentecoſt and advent, and from epiphany to ſeptuageſima; the violet in advent and Chriſtmas, in vigils, rogations, &c. and in votive maſſes in time of war; laſtly, the black is for the dead, and the ceremonies thereto belonging.

In the Greek church, the uſe of colours is almoſt aboliſhed, as well as among us. Red was, in the Greek church, the colour for Chriſtmas and the dead, as black among us.

To Colour Strangers Goods, is when a freeman allows a foreigner to enter goods at the cuſtomhouſe in his name.

Colour-Making, the art of preparing the different kinds of colours uſed in painting.

This art properly belongs to chemiſtry; and is one of the moſt curious, though leaſt underſtood, parts of it. The principles on which colour-making depends are entirely different from thoſe on which the theory of other parts of chemiſtry is founded; and the practical part being in the hands of thoſe who find it their intereſt to conceal their methods as much as poſſible, it thence happens, that there is not only no diſtinct theory of this art, but ſcarce a ſingle good receipt for making any one colour hath ever yet appeared.

1
Diviſion of colours into opaque and tranſparent.

The firſt general diviſion of colours is into opaque and tranſparent. By the firſt are meant ſuch colours as, when laid over paper, wood, &c. cover them fully ſo as to efface any other painting or ſtain that might have been there before; the others are of ſuch a nature as to leave the ground on which they are laid viſible through them. Of the firſt kind are white-lead, red-lead, vermilion, &c.; of the latter kind are the colours uſed for illuminating maps, &c.

2
Oil and water colours.

Another diviſion is into oil-colours and water-colours; by which is meant ſuch as are appropriated to painting in oil and in water. Moſt of thoſe which are proper for painting in water, are alſo proper for being uſed in oil. There is, however, this remarkable difference betwixt colours when mixed with water and with oil, that ſuch as are quite opaque in water will become perfectly tranſparent in oil. Thus, blue verditer, though exceedingly opaque in water, if ground with oil, ſeems totally to diſſolve, and will become very tranſparent. The ſame thing happens to ſuch colours as have for their baſis the oxide of tin, alabaſter, or calcareous earth. The moſt perfectly opaque colours in oil are ſuch as have lead, mercury, or iron, for their baſis: to the latter, however, Pruſſian blue is an exception; for though the baſis of that colour is iron, it proves quite tranſparent when ground with oil. In water colours, thoſe prepared from metals, Pruſſian blue alone excepted, are always opaque; from vegetables or animals, tranſparent. Coals, however, whether vegetable or animal, are opaque both in water and oil.

3
Simple and compound ones.

Colours, again, may be conſidered as either ſimple or compound. The ſimple ones are ſuch as require nothing to be ſuperadded to them, in order to make a full ſtrong colour, without regarding whether they are formed of many or few ingredients; and in this view, white-lead, red-lead, vermilion, oxides of iron, &c. are ſimple colours. The compound ones are formed by the union of two or more colouring ſubſtances; as blue and yellow united together to form a green, red and yellow to form an orange, a white earth or oxide with the red colour of cochineal or brazil to form a lake, &c.; and thus carmine, lake, roſe-pink, Dutch-pink, Engliſh-pink, &c. are compound colours.

4
True and falſe colours.

The laſt and moſt important diviſion of colours is into true and falſe. By the former are meant thoſe which retain their colour under every poſſible variety of circumſtances, without fading in the leaſt: the others are ſuch as do not; but either loſe their colour altogether, or change to ſome other. What is chiefly apt to affect colours, is their being expoſed to the ſun in ſummer, and to the cold air in winter: but to this there is one exception, viz. white-lead; which, when ground with oil, retains its whiteneſs if expoſed to the weather, but degenerates into a browniſh or yellowiſh colour if cloſe kept. In water this ſubſtance is very apt to loſe its colour, whether expoſed to the air or not. The great deſideratum in colour-making is to produce the firſt kind of colours, viz. ſuch as will not fade by expoſure to the weather; and indeed it is to be regretted, that the moſt beautiful are in general the leaſt permanent. It may, for the moſt part, however, be expected, that the more ſimple any colour is, the leſs liable will it be to change upon expoſure to the air.

5
Inſtances of colours produced by expoſure to the ſun and air.

6
By the mixture of two vegetable juices.

The great difficulty of knowing *à priori* whether a colour will fade or not, is owing to our ignorance concerning the nature of colouring ſubſtances. With all our diſadvantages, however, we may obſerve, that whatever change of colour is produced in any ſubſtance by expoſure to the ſun and air, that colour to which it changes will bid fair for being permanent, and therefore ought to be employed where it can be done. Of theſe changes the inſtances are but very rare. One is in the purple of the ancients, which aſſumed its colour by expoſure to the ſun, and conſequently was exceedingly permanent. Another is in the ſolution of ſilver; which, being mixed with chalk, the precipitate turns to purpliſh black where it is expoſed to the ſun. A third is in ſolutions of indigo by alkaline ſubſtances, which conſtantly appear green till expoſed to the air by ſpreading them very thin, upon which they become almoſt inſtantaneouſly blue, and continue ſo ever after. Sometimes, though ſtill more rarely, a very remarkable change of colour happens, upon mixing two vegetable juices together. Almoſt the only inſtance of this we have on the authority of Mr George Forſter, who informs us, that the inhabitants of Otaheite dye their cloth of a crimſon colour, by mixing together the yellow juice of a ſmall ſpecies of fig with the greeniſh juice of a kind of fern. But the moſt remarkable alterations of colour are effected by different metallic and ſaline ſolutions mixed with certain animal or vegetable ſubſtances; and with theſe the colour-maker will be principally converſant.

7
Effects of acids and alkalies on colours.

It is a common obſervation in chemiſtry, that acids mixed with blue vegetable juices turn them red, and alkalies green. It is equally certain, though not ſo generally known, that acids of all kinds generally tend to heighten red colours, ſo as to make them approach to the ſcarlet or true crimſon; and alkalies to darken, or make them approach to blue or purple. Mixed with yellow colours, acids alſo univerſally tend to brighten the yellow; and alkalies to turn it to an orange, and make it become more dull. But though this is very generally the caſe, we are not to expect that all acids are equally powerful in this reſpect. The nitric acid is found to heighten the moſt of any, and the muriatic acid the leaſt of the mineral ones. The vegetable, as might be expected, are leſs powerful than the mineral acids. Thus, if with a tincture of cochineal, either in water or alcohol, is mixed the pure nitrous acid, it will change the colour to an exceeding high orange or flame colour, which it will impart to cloth. If ſulphuric acid is uſed, a full ſcarlet, inclining to crimſon rather than orange, is produced. With muriatic acid a true crimſon colour, bordering on purple, is the conſequence. Alkalies, both fixed and volatile, change the colour to a purple, which is brighter with the volatile than the fixed alkalies.

8
Permanency of colours, by what determined.

Here it is obvious, that whatever colours are produced by the mixture of different ſubſtances together; the permanency of theſe colours can only be in proportion to the ability of ſuch mixtures to reſiſt the weather. Thus, ſuppoſe a high ſcarlet or orange colour is produced by means of ſpirit of nitre, it is plain that, was ſuch a colour expoſed to the air, it could remain no longer than the ſpirit of nitre which produced it remained. In proportion, therefore, as the ſpirit of nitre was exhaled into the air, or otherwiſe deſtroyed, the colour behoved to fade, and at laſt to be totally deſtroyed; and thus, in proportion to the deſtructibility of the ſubſtances by which colours are produced, will be the diſpoſition of ſuch colours to fade, or the contrary. In this reſpect alkalies are much more deſtructible than acids, and conſequently leſs proper for the preparation of colours. With regard to acids, the nitric ſeems moſt deſtructible, the ſulphuric leſs ſo, and the muriatic the leaſt of all. From the extreme fixity of the phoſphoric acid and ſedative ſalt, perhaps they might be of ſervice in preſerving colours.

9
Opaque or tranſparent colours, how formed.

10
Oxide of tin, the moſt proper baſis for fine colours.

11
Precipitate of lead moſt proper for coarſe ones.

As all colours, whether derived from the animal or vegetable kingdom, muſt be extracted either by pure water or ſome other liquid menſtruum, they cannot be uſed for the purpoſes of painting till the colouring ſubſtance is united with ſome earthy or ſolid matter, capable of giving it a *body*, as the workmen call it; and according to the nature of this ſubſtance, the colour will be tranſparent or otherwiſe. This baſis ought to be of the moſt fixed and durable nature; unalterable by the weather, by acids, or by alkalies. It ought alſo to be of a pure white colour, and eaſily reducible into an impalpable powder. For this reaſon all earthy ſubſtances ſhould be avoided as being acted upon by acids; and therefore, if any of theſe were added to heighten the colour, they would not fail to be deſtroyed, and their effect totally loſt. Precipitates of lead, biſmuth, &c. though exceedingly fine and white, ought alſo to be avoided, as being apt to turn black by expoſure. The only ſubſtance to be choſen in preference to all others, is oxide of tin, prepared either by fire or the nitric acid. This is ſo exceedingly refractory as not only to be unalterable by alkalies, acids, or the ſun and weather, but even by the focus of a very large burning mirror. It is beſides white as ſnow, and capable of being reduced to an extreme degree of fineneſs, inſomuch that it is made uſe of for poliſhing metallic ſpeculums. For theſe reaſons, it is the moſt proper baſis for all fine colours. For coarſe ones, the white precipitate of lead, mentioned under the article CHEMISTRY, will anſwer very well. It hath a very ſtrong body, i. e. is very opaque, and will cover well; may be eaſily ground fine, and is much leſs apt to turn black than white lead; it is beſides very cheap, and may be prepared at the ſmall expence of 3d. per pound.

12
General method of preparing colours.

If what we have juſt now obſerved is attended to, the general method of extracting colours from any vegetable or animal ſubſtance, and fixing them on a proper baſis, muſt be very eaſily underſtood. For this purpoſe, a quantity of oxide of tin is to be procured in proportion to the quantity of colour deſired. This muſt be well rubbed in a glaſs mortar, with a little of the ſubſtance deſigned for brightening the colour, as alum, cream of tartar, ſpirit of nitre, &c. after which it muſt be dried, and left for ſome time, that the union between the two ſubſtances may be as perfect as poſſible. If the colour is to be a very fine one, ſuppoſe from cochineal, the colouring matter muſt be extracted with alcohol without heat. When the ſpirit is ſufficiently impregnated, it is to be poured by little and little upon the oxide, rubbing it conſtantly, in order to diſtribute the colour equally through all parts of the oxide. The ſpirit ſoon evaporates, and leaves the oxide coloured with the cochineal. More of the tincture is then to be poured on, rubbing the mixture conſtantly as before; and thus, with proper management, may very beautiful colours, not inferior to the beſt carmine, be prepared at a moderate expence. If, inſtead of cochineal, we ſubſtitute brazil-wood, turmeric, logwood, &c. different kinds of red, yellow, and purple, will be produced. For the coarſer colours, aqueous decoctions are to be uſed in a ſimilar manner; only as theſe are much longer in evaporating than the alcohol, very little muſt be poured on at a time, and the colours ought to be made in large quantity, on account of the tediouſneſs of the proceſs.

13
Effects of different kinds of ſalts.

Hitherto we have conſidered only the effects of the pure and ſimple ſalts, viz. acids and alkalies, on different colours; but by combining the acids with alkalies, earths, or metals, theſe effects may be varied almoſt *in infinitum*; neither is there any rule yet laid down by which we can judge *à priori* of the changes of colour that will happen on the admixture of this or that particular ſalt with any colouring ſubſtance. In general, the perfect neutrals act weakly; the imperfect ones, eſpecially thoſe formed from metals, much more powerfully. Alum and ſal ammoniac conſiderably heighten the colour of cochineal, brazil, turmeric, fuſtic, madder, logwood, &c. The ſame thing is done, though in a leſs degree, by common ſalt, Glauber's ſalt, nitre, and many other neutrals. Solutions of iron in all the acids ſtrike a black with every one of the above-mentioned ſubſtances; and likewiſe with ſumach, galls, and other aſtringents. Solutions of lead, or ſaccharum ſaturni, univerſally debaſe red colours to a dull purple. Solution of copper changes the purple colour of logwood to a pretty good blue; and, in general, ſolutions of this metal are friendly to blue colours. The effects of ſolutions of gold, ſilver, and mercury, are not ſo well known; they ſeem to produce dark colours of no great beauty.

14
Solution of tin the moſt powerful.

The moſt powerful ſolution, however, with regard to a great number of colours, is that of tin, made in nitro-muriatic acid. Hence we may ſee the fallacy of Mr Delaval's hypotheſis concerning colours *, that the leaſt refrangible ones are produced by the moſt denſe metals: for tin, which hath the leaſt denſity of any metal, hath yet, in a ſtate of ſolution, the moſt extraordinary effects upon the leaſt refrangible colours as well as thoſe that are moſt ſo. The colour of cochineal is changed by it into the moſt beautiful ſcarlet; a ſimilar change is made upon the colouring matter of gum-lac. Brazil-wood is made to yield a fine purpliſh crimſon; logwood, a beautiful dark purple; turmeric, fuſtic, weld, and all yellow-colouring woods and flowers, are made to communicate colours far more beautiful than can be got from them by any other method. The blue colour of the flowers of violets, eye-bright, iris, &c. are heightened ſo as to equal, if not excel, the blue produced by a ſolution of copper in volatile alkali. In ſhort, this ſolution ſeems to be of much more extenſive uſe in colour-making, when properly applied, than any thing hitherto thought of. It is not, however, univerſally ſerviceable. The colour of madder it totally deſtroys, and likewiſe that of ſaf-flower, changing them both to a dull orange. It likewiſe ſpoils the colour of archil; and what is very remarkable, the fine red colour of tincture of roſes made with ſulphuric acid is by ſolution of tin changed to a dirty green.

* See *Chromatics*, N° 8.

15
Directions for the choice of colouring materials.

The moſt important conſideration in colour-making is to make choice of ſuch materials as produce the moſt durable colours; and if theſe can be procured, an ordinary colour from them is to be preferred to a bright one from thoſe which fade ſooner. In what the difference conſiſts between the colours that fade and thoſe which do not, is not known with any degree of certainty. From ſome appearances it would ſeem, that thoſe ſubſtances which are moſt remarkable for keeping their colour, contain a viſcous glutinous matter, ſo combined with a reſinous one as to be ſoluble both in water and alcohol. The moſt durable red colour is prepared from gum-lac. This is very ſtrongly reſinous, though at the ſame time ſo far glutinous, that the colouring matter can be extracted from it by water. Next to gum-lac are madder roots and cochineal. The madder is an exceedingly penetrating ſubſtance, inſomuch that, when given to animals along with their food, it tinges their bones of a deep red colour. Its colouring matter is ſoluble both in water and alcohol. Along with the pure red, however, there is in madder a kind of viſcous aſtringent ſubſtance, of a dark brown colour, which ſeems to give the durability to the whole. The colouring matter of cochineal, though ſoluble both in water and alcohol, is very tenacious and mucilaginous, in which it bears ſome reſemblance to the *purpura* of the ancients, which kept its colour exceedingly well. Where the colours are fugitive, the tinging ſubſtance ſeems to be too reſinous or too mucilaginous. Thus the colours of brazil, turmeric, &c. are very reſinous, eſpecially the latter, inſomuch that the colouring matter of turmeric can ſcarcely be extracted by water. Both theſe are periſhable, though beautiful colours; and much more are the red, purple, and blue flowers, commonly to be met with. Theſe ſeem to be entirely mucilaginous, without the leaſt quantity of reſinous matter. The yellow flowers are different, and in general keep their colour pretty well. Whether it would be poſſible, by adding occaſionally a proper quantity of gum or reſin, to make the fugitive colours more durable, hath not yet been tried, but ſeems to have ſome probability.

16
M. Hell method improvin the dura lity of br zil-wood

What tends a little to confirm this, is a proceſs given by M. Hellot for imparting durability to the colour of brazil. It conſiſts only in letting decoctions of the wood ſtand for ſome time in wooden caſks till they grow ſtale and *ropy*. Pieces of woollen cloth now dyed in the liquor acquired a colour ſo durable, that they were not in the leaſt altered by expoſure to the air during four months in the winter ſeaſon. Whether this change in the durability of the colour was effected by the ropineſs following the fermentation,

tion, or by ſome other cauſe, or whether the experiment can be at all depended upon, muſt be referred to future obſervation.

17 Preparation of different colours. Having thus collected all that can as yet be depended upon for eſtabliſhing a general theory of colour-making, we ſhall now proceed to give an account of the different pigments generally to be met with in the colour-ſhops.

18 Lamp-black. 1. *Black*. Theſe are lamp-black, ivory-black, blue-black, and Indian-ink. The firſt is the fineſt of what are called the ſoot-blacks, and is more uſed than any other. Its preparation is deſcribed in the Swediſh Tranſactions for the year 1754, as a proceſs dependent on the making of common reſin: the impure reſinous juice collected from inciſions made in pine and fir trees, is boiled down with a little water, and ſtrained whilſt hot through a bag; the dregs and pieces of bark left in the ſtrainer are burnt in a low oven, from which the ſmoke is conveyed through a long paſſage into a ſquare chamber, having an opening on the top on which is a large ſack made of thin woollen ſtuff: the ſoot, or lamp-black, concretes partly in the chamber, from whence it is ſwept out once in two or three days, and partly in the ſack, which is now and then gently ſtruck upon, both for ſhaking down the ſoot, and for clearing the interſtices betwixt the threads, ſo as to procure a ſufficient draught of air through it. In this manner lamp-black is prepared at the turpentine houſes in England, from the dregs and refuſe of the reſinous matters which are there manufactured.

19 Dr Lewis's obſervations. On this ſubject Dr Lewis hath ſome curious obſervations. "The ſoot (ſays he) ariſing in common chimneys, from the more oily or reſinous woods, as the fir and pine, is obſerved to contain more diſſoluble matter than that from the other woods; and this diſſoluble matter appears, in the former, to be more of an oily or reſinous nature than in the latter, alcohol extracting it moſt powerfully from the one, and water from the other. The oilineſs and ſolubility of the ſoot ſeeming therefore to depend on thoſe of the ſubject it is made from, it has been thought that lamp-black muſt poſſeſs theſe qualities in a greater degree than any kind of common ſoot. Nevertheleſs, on examining ſeveral parcels of lamp-black, procured from different ſhops, I could not find that it gave any tincture at all, either to alcohol or to water.

"Suſpecting ſome miſtake or ſophiſtication, or that the lamp-black had been burnt or charred, as it is to fit it for ſome particular uſes, I prepared myſelf ſome ſoot from linſeed oil, by hanging a large copper pan over the flame of a lamp to receive its ſmoke. In this manner the more curious artiſts prepare lamp-black for the nicer purpoſes; and from this collection of it from the flame of a lamp, the pigment probably received its name. The ſoot ſo prepared gave no tincture either to water or to alcohol, any more than the common lamp-back of the ſhops. I tried different kinds of oily and reſinous bodies with the ſame reſult; even the ſoots obtained from fiſh-oils and tallow did not appear to differ from thoſe of the vegetable-oils and reſins. They were all of a finer colour than the lamp-black commonly ſold.

"Some ſoot was collected in like manner from fir and other woods, by burning ſmall pieces of them ſlowly under a copper-pan. All the ſoots were of a deeper black colour than thoſe obtained from the ſame kinds of woods in a common chimney; and very little, if at all, inferior to thoſe of the oils: they gave only a juſt diſcernible tincture to water and alcohol, while the ſoots of the chimney imparted a ſtrong deep one to both. The ſoot of mineral bitumens, in this cloſe way of burning, appears to be of the ſame qualities with thoſe of woods, oil, and reſins: in ſome parts of Germany, great quantities of good lamp-black are prepared from a kind of pit-coal.

"It appears, therefore, that the differences of ſoots do not depend altogether on the qualities of the ſubjects, but in a great meaſure on the manner in which the ſubject is burnt, or the ſoot caught. The ſoots produced in common chimneys, from different kinds of wood, reſinous and not reſinous, dry and green, do not differ near ſo much from one another, as thoſe which are produced from one kind of wood in a common chimney, and in the confined way of burning above mentioned."

20 Ivory-black. Ivory-black is prepared from ivory or bones burnt in a cloſe veſſel. This, when finely ground, forms a more beautiful and deeper colour than lamp-black; but in the common methods of manufacturing, it is ſo much adulterated with charcoal-duſt, and ſo groſsly levigated, as to be unfit for uſe. An opaque deep black for water-colours, is made by grinding ivory-black with gum-water, or with the liquor which ſettles from the whites of eggs after they have been ſuffered to ſtand a little. Some uſe gum-water and the whites of eggs together, and report, that a ſmall addition of the latter makes the mixture flow more freely from the pencil, and improves its gloſſineſs. It may be obſerved, however, that though ivory-black makes the deepeſt colour in water as well as in oil painting, yet it is not on this account always to be preferred to other black pigments. A deep jet-black colour is ſeldom wanted in painting; and in the lighter ſhades, whether obtained by diluting the black with white bodies, or by applying it thin on a white ground, the particular beauty of the ivory-black is in a great meaſure loſt.

21 Blue-black. Blue black is ſaid to be prepared from the burnt ſtalks and tendrils of the vine. Theſe, however, the colour-makers ſeldom give themſelves the trouble of procuring, but ſubſtitute in its place a mixture of ivory-black and the common blue uſed for clothes.

22 Indian-ink. Indian-ink is an excellent black for water-colours. It hath been diſcovered by Dr Lewis to conſiſt of a mixture of lamp-black and common glue. Ivory-black, or charcoal, he found to anſwer equally well, provided they were levigated to a ſufficient degree of fineneſs, which indeed requires no ſmall trouble.

23 White colours. 2. *White*. The white colours commonly to be met with are, white-flake, white-lead, calcined hartſhorn, pearl-white, Spaniſh-white, egg-ſhell-white, and nitrate of biſmuth. The flake-white and white-lead are properly the ſame. The preparation of the former is kept a ſecret; the method of preparing the latter is deſcribed under CHEMISTRY, N° 1856. Theſe are the only whites that can be uſed in oil, all the reſt being tranſparent unleſs they are laid on with water. Calcined hartſhorn is the moſt uſeful of the earthy whites, as being the leaſt alkaline. Spaniſh-white is only

finely prepared chalk. Pearl-white is made from oyſter-ſhells; and egg-ſhell white from the ſhells of eggs. All theſe, by their attraction for acids, muſt neceſſarily deſtroy ſuch colours as have any acid or metallic ſalt in their compoſition. The nitrate of biſmuth is apt to turn black, as are alſo flake-white and white-lead, when uſed in water. The white precipitate of lead recommended under CHEMISTRY, N° 1856. is greatly ſuperior as a water-colour to all theſe, being perfectly free of any alkaline quality, and not at all apt to loſe its own colour, or to injure that of other ſubſtances. It is a carbonate of lead.

24 Red colours. 2. *Red.* The red colours uſed in painting are of two ſorts, viz. thoſe which incline to the purple, and ſuch as are of a full ſcarlet, and tend rather to the orange. The firſt are carmine, lake, roſe-pink, red-ochre, and Venetian-red. The ſecond are vermilion, red-lead, ſcarlet-ochre, common Indian-red, Spaniſh-brown, and terra di Sienna, burnt.

We have already laid down ſome general rules for the preparation of carmine and lake. Particular receipts have been delivered with the greateſt confidence for making theſe fine colours; but all of them muſt neceſſarily prove ineffectual, becauſe an earthy baſis is recommended for ſtriking the colour upon. From the principles of chemiſtry, however, we are certain, that if nitric acid, or ſolution of tin, is made uſe of for brightening a colour made with any earthy baſis, it muſt infallibly be deſtroyed by that baſis, by reaſon of its alkaline quality. Carmine is the brighteſt and moſt beautiful red colour known at preſent; the beſt comes from France. Lake differs from it in being capable of mixture with oil, which carmine is not, unleſs with great difficulty. The former is alſo much more inclined to purple than carmine. This laſt quality, however, is reckoned a defect; and accordingly, the more that lake approaches to the ſcarlet or true crimſon, the more it is valued. On dropping ſolution of tin into an aqueous tincture of brazil-wood, a beautiful precipitate falls, of a purpliſh crimſon colour. This may be very well ſubſtituted in place of the dearer lakes on many occaſions.

Roſe-pink is a very beautiful colour, inclining more to the purple than ſcarlet. It ſeems to be made of chalk, coloured with a decoction of brazil-wood, heightened by an alkaline ſalt; for which reaſon it is exceedingly periſhable, and but little eſteemed. The colour might be made much more durable, as well as better, by employing for a baſis the white precipitate of lead abovementioned, and brightening it with ſolution of tin.

Red ochre and Venetian red differ in nothing from the colcothar of vitriol well calcined. The oxides of iron may be made to appear either purpliſh, or inclining to the ſcarlet, according to the manner in which the calcination is performed. If the matter is perfectly deprived of its phlogiſton, and ſubjected to an intenſe fire, it always turns out red; but the mixture of a ſmall quantity of inflammable matter gives it a purpliſh caſt. Hence various paints are kept in the ſhops under different names, which yet differ from each other only in the ſlight circumſtance above mentioned; and ſuch are the ſcarlet-ochre, Spaniſh-brown, and terra di Sienna burnt. It is remarkable, that the oxides of iron never ſhow their colour till they become cold. Colcothar of vitriol, while hot, always appears of a very dark duſky purple.

Of the preparation of vermilion and red-lead, an account is given under the article CHEMISTRY, N° 1721. 1832. Theſe are very durable colours; the firſt is the beſt red uſed in oil painting, but does not anſwer well in water; the other is rather an orange; and, like other preparations of lead, is in ſome caſes apt to turn black.

25 Orange colours. 3. *Orange.* The only true orange-coloured paints are red orpiment and orange lake. The firſt is a ſublimate formed of arſenic and ſulphur: the other may be prepared from turmeric infuſed in alcohol having its colour ſtruck upon oxide of tin, and brightened by a ſolution of that metal. All the ſhades of orange, however, may be extemporaneouſly prepared by mixing red and yellow colours together, in due proportions.

26 Yellow colours. 5. *Yellow.* The yellow paints moſt commonly in uſe are, king's-yellow, Naples-yellow, Dutch-pink, Engliſh-pink, maſticot, common orpiment, yellow-ochre, terra di Sienna unburnt, and turpith-mineral.

King's-yellow is evidently an arſenical preparation. Its colour is exceedingly beautiful, but apt to fade, on which account, and its great price, it is ſeldom uſed.

Naples-yellow was for a long time thought to be a preparation of arſenic, but is now diſcovered to have lead for its baſis. It is therefore apt to turn black and loſe its colour, which makes it the leſs valuable. It is nevertheleſs uſed in preference to king's-yellow, on account of its inferiority in price. This colour is particularly liable to be ſpoiled by iron when moiſt, and therefore ſhould never be touched by that metal unleſs previouſly ground in oil.

Dutch-pink is ſaid to be prepared by ſtriking the colour of yellow berries upon finely levigated chalk. But of this there is great reaſon to doubt; the baſis of Dutch-pink ſeems much more hard and gritty than chalk, and its colour more durable than thoſe ſtruck upon that earth uſually are. Very good yellows may be prepared with the white precipitate of lead, formerly mentioned, by uſing either yellow berries, fuſtic, or any other ſubſtance capable of yielding that colour. Engliſh pink is paler than the Dutch, and keeps its colour greatly worſe.

Maſticot is prepared by calcining white-lead till it aſſumes a yellowiſh colour. It is not apt to change, but the colour is ſo dull that it is ſeldom uſed either in oil or water.

Common orpiment is a pretty bright greeniſh-yellow, prepared by ſubliming arſenic with ſulphur. Its nauſeous ſmell, which is greatly increaſed by grinding in oil, makes it very diſagreeable; nor does it keep its colour for any length of time. That kind of orpiment leaſt inclined to green is to be preferred for the purpoſes of painting.

Yellow-ochre and terra di Sienna are ferruginous earths, capable of becoming red by calcination. Green vitriol precipitated by lime may be advantageouſly ſubſtituted for either of them. See CHEMISTRY.

Turpith mineral is but little uſed in painting, though its fine yellow colour ſeems greatly to recommend it. This preparation is in all probability very durable;

and ſhould ſeem therefore worthy of a preference either to king's or Naples yellow. See Chemistry *Index*.

Gamboge is a paint that can only be uſed in water, and is the moſt common yellow made uſe of for colouring maps, &c. but for this it is not very proper, being neither quite tranſparent, nor very durable.

27 Green colours.

6. *Green*. The only ſimple green colour that hath a tolerable degree of brightneſs is verdigris, or preparations of it. This, however, though a very beautiful colour, is far from being durable. It is improved in colour, though not in durability, by diſſolution and cryſtallization in diſtilled vinegar, in which ſtate it is called *diſtilled verdigris*. A more durable water colour is made by diſſolving the verdigris in cream of tartar, or rather the pure tartaric acid; but in oil this is found to be equally fugitive with the verdigris itſelf. See Chemistry *Index*.

Compound greens are either made of Pruſſian or ſome other blue, mixed with yellow; but in whatever way theſe colours can be compounded, the beauty of the green produced is greatly inferior to diſtilled, or even common verdigris. The tartaric ſolution of verdigris, mixed with a little gamboge, is the beſt tranſparent green water-colour we have had an opportunity of trying; and a mixture of Pruſſian blue and turpith-mineral is probably the beſt opaque one.

Sap-green is a ſimple colour, but exceedingly inferior to diſtilled verdigris, or even to the tartaric ſolution of verdigris with gamboge. It is prepared from the juice of unripe buckthorn berries evaporated to the conſiſtence of a gum. Its green colour is greatly inclined to yellow. A kind of compound green has been ſometimes uſed, called *Pruſſian-green*, which conſiſts only of Pruſſian blue and yellow ochre. It has no beauty, nor is it durable. It is prepared as Pruſſian blue, only not pouring on any muriatic acid to diſſolve the ochreous ſediment which falls at the ſame time.

Another green ſometimes uſed is called *terre verte*. This is a native earth, probably impregnated with copper. It is of a bluiſh-green colour, much of that tint called *ſea-green*. It is gritty, and therefore muſt be well levigated before it is uſed. Its colour is durable, but not very bright.

28 Blue colours.

7. *Blue*. The blue colours are ultramarine, Pruſſian-blue, verditer, ſmalt, bice, and indigo. Of theſe the ultramarine is the fineſt, but its great price hinders it being much uſed. It is a preparation from lapis lazuli; is an exceeding bright colour, and never fades with whatever ſubſtance it is mixed. It is now, however, in a great meaſure ſuperſeded by Pruſſian blue, to the diſadvantage of painting in general; as Pruſſian blue, though very beautiful, is far from being durable. For an account of its preparations ſee the article Ultramarine.

The proceſs for making Pruſſian blue is deſcribed, and its nature fully conſidered, under Chemistry, N° 774; ſo that it is ſufficient here to obſerve, that Pruſſian blue is to be accounted of the beſt quality when it is deep, bright, and not inclined to purple. It ought to be tried by mixture with white lead, as the brightneſs of the colour will appear much more when diluted than when concentrated in the lumps of the blue itſelf.

The preparation of blue verditer is kept a ſecret, and the beſt chemiſts have been puzzled to find out the method. The colour is exceedingly bright, and has a conſiderable tinge of green. A method of preparing a colour equally beautiful, and agreeing in all reſpects with what is ſold in the ſhops, except that of effervеſcing with acids, we have found to be as follows: Diſſolve copper in ſtrong cauſtic alkali, until the liquid has aſſumed a very deep blue colour; and the deeper this colour is, the finer will your verditer be. When the menſtruum has diſſolved as much of the metal as it can take up, it is to be poured out into a broad and well glazed earthen pan, held over a very gentle fire; and from the moment it is put on, the liquor is to be continually agitated with a wooden ſpatula, ſo that the liquor may be heated as equally as poſſible. The whole ſecret conſiſts in properly regulating the degree of heat; for if it exceeds the due proportion ever ſo little, the verditer will turn out of a dirty green. The proper degree is about 90° of Fahrenheit's thermometer. In this gentle heat the alkali ſlowly evaporates; and in proportion to its doing ſo the verditer falls to the bottom. After it is once formed, freed from the alkaline liquor, and dried, it can bear the effuſion of boiling water without the leaſt injury. Dr Prieſtley, in his ſixth volume, takes notice, that a ſolution of copper in volatile alkali affords a blue precipitate by heat, but without taking notice of the requiſites for its ſucceſs. In making this preparation it is neceſſary to diſſolve copper in its metallic ſtate; for the ſolution of any oxide will not yield a blue but a green colour. This colour is durable in water, but diſſolves in oil, and has then all the inconveniencies of verdigris above mentioned.

Smalt is glaſs coloured with zaffre, a preparation from cobalt *. It is commonly ſo groſsly powdered that it cannot be uſed in painting, and its texture is ſo hard that it cannot eaſily be levigated. Its colour is exceedingly bright and durable; ſo that when finely levigated it is uſed inſtead of ultramarine. The moſt proper materials for levigating this ſubſtance ſeem to be the plates of M. Reaumur's porcelain recommended by Dr Lewis. See Chemistry *Index*. For the preparation and qualities of bice, ſee the articles *Armenus Lapis* and Bice.

Indigo is but little uſed in painting either in oil or water, on account of the dulneſs of the colour. It requires no other preparation than being waſhed over. Its goodneſs is known by the darkneſs and brightneſs of the colour. See Indigo.

29 Purple colours.

8. *Purple*. The only ſimple colour of this kind uſed at preſent is colcothar of vitriol. A beautiful purple lake may be prepared from logwood by means of ſolution of tin; but this method of preparing colours is very little known as yet.

30 Brown colours.

9. *Brown*. The brown colours are, biſtre, brown-ochre, Cologne-earth, umbre, and brown-pink. Under the article Bistre is given a proceſs for making that colour, by infuſing ſoot in water, pouring off the tincture, and then evaporating it to an extract; but Dr Lewis is of opinion, with M. Landois in the French *Encyclopédie*, that the ſoot is either boiled in water, or ground with a little liquid of ſome kind into a ſmooth paſte; it is then diluted with more water, and after ſtanding for about half an hour till the groſſer ſubſtance of the ſoot has ſettled, the liquor is poured off into

31 Dr Lewis's opinion concerning biſtre.

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* See *Zaffre* and *Smalt*.

into another veſſel, and ſet by for two or three days, that the finer parts may fall to the bottom, and this fine matter is the biſtre. This is a very uſeful colour in water, being exceedingly fine, durable, and not apt to ſpoil any other colours with which it is mixed. The brown pink is ſaid to conſiſt of chalk tinged with the colouring matter of fuſtic, heightened by fixed alkaline ſalts. It is therefore very periſhable, and is ſeldom uſed. The other browns are a kind of ochreous earths; for a deſcription of which ſee their proper articles.

32
Attempts to make lake of all colours.

Having now conſidered moſt of the colouring ſubſtances uſually to be met with in the ſhops, we ſhall next take notice of ſome attempts that have been made to produce all the different colours from vegetables, after the manner of lakes; which, though the methods hitherto tried have for the moſt part failed of ſucceſs, may perhaps ſome time or other be found applicable to valuable purpoſes.

33
Black from aſtringents.

From infuſions of aſtringent vegetables mixed with green vitriol, is produced a deep black liquor of very extenſive uſe in dyeing*. The ſubſtances which produce the deepeſt blacks are galls and logwood. When a decoction or infuſion of the galls is dropped into a ſolution of the vitriol largely diluted with water, the firſt drops produce bluiſh or purpliſh red clouds, which ſoon mingling with the liquor, turn it uniformly of their own colour. It ſeems to be on the quality of the water that this difference in the colour depends. With diſtilled water, or the common ſpring-waters, the mixture is always blue. If we previouſly diſſolve in the water the moſt minute quantity of any alkaline ſalt, too ſmall to be diſcovered by any of the common means by which waters are uſually tried, or if the water is in the leaſt putrid, the colour of the mixture proves purple or reddiſh. Rain-water, caught as it falls from the clouds in an open field in clean glaſs-veſſels, gives a blue; but ſuch as is collected from the tops of the houſes, grows purple with the mixture of vitriol and galls: from whence it may be preſumed, that this laſt has contracted a putrid tendency, or received an alkaline impregnation, though ſo ſlight as not to be ſenſible on other ways of trial.

Both the purple and blue liquors, on adding more of the aſtringent infuſion, deepen to a black, more or leſs intenſe according to the nature of dilution: if the mixture proves of a deep opaque blackneſs, it again becomes bluiſh or purpliſh when further diluted. If ſuffered to ſtand in this diluted ſtate for two or three days, the colouring matter ſettles to the bottom in form of a fine black mud, which by ſlightly ſhaking the veſſel, is diffuſed again through the liquor, and tinges it of its former colour. When the mixture is of a full blackneſs, this ſeparation does not happen, or in a far leſs degree; for though a part of the black matter precipitates in ſtanding, yet ſo much remains diſſolved, that the liquor continues black. This ſuſpenſion of the colouring ſubſtance, in the black liquid, may be attributed in part to the gummy matter of the aſtringent infuſion increaſing the conſiſtence of the watery fluid; for the ſeparation is retarded in the diluted mixture by a ſmall addition of gum arabic. If the mixture either in its black or diluted ſtate is poured into a filter, the liquor paſſes through coloured; only a part of the black matter remaining on the filter. The filtered liquor on ſtanding for ſome time becomes turbid and full of fine black flakes: being freed from theſe by a ſecond filtration, it again puts on the ſame appearance; and thus repeatedly till all the colouring parts are ſeparated, and the liquor has become colourleſs.

Dr Lewis, from whoſe Philoſophical Commerce of Arts this account is taken, further informs us, that this colouring matter, when ſeparated from the liquor and dried, appeared of a deep black, which did not ſeem to have ſuffered any change from the air by expoſure for upwards of four months. Made red-hot, it glowed and burnt, but did not flame, and became a ruſty brown powder, which was readily attracted by a magnetic bar; though in its black ſtate the magnet had no action upon it. Sulphuric acid, diluted with water and digeſted on the black powder, diſſolved the greateſt part of it, leaving only a very ſmall quantity of whitiſh matter. Solution of pure fixed alkaline ſalt diſſolved very little of it: the liquor received a reddiſh brown colour, and the powder became blackiſh brown. This reſiduum was attracted by the magnet after being red-hot, though not before: the alkaline tincture, paſſed through a filter, and mixed with a ſolution of green vitriol, ſtruck a deep browniſh black colour, nearly the ſame with that which reſults from mixing with the vitriolic ſolution an alkaline tincture of galls.

34
Black from a combination of other colours.

It hath alſo been attempted to produce black from a combination of other colours; as green may be produced from a mixture of blue and yellow. M. le Blon, in his Harmony of Colours, gives a method of forming black, by mixing together the three colours called *primitive*, viz. blue, red, and yellow; and M. Caſtel, in his *Optique des Couleurs*, publiſhed in 1740, ſays that this compound black has an advantage in painting, above the ſimple ones, of anſwering better for the darkening of other colours. Thus, if blue, by the addition of black, is to be darkened into the colour called *blue-black*, the ſimple blacks, according to him, if uſed in ſufficient quantity to produce the requiſite deepneſs, conceal the blue, while the compound blacks leave it diſtinguiſhable. Le Blon does not mention the proportions of the three colours neceſſary for producing black. Caſtel directs 15 parts of blue, five of red, and three of yellow; but takes notice, that theſe proportions are rather ſpeculatively than practically juſt, and that the eye only can be the true judge; our colours all being very imperfect, and our pigments or other bodies of one denomination of colour being very unequal in their degree of intenſity. He obſerves, that the pigments ſhould all be of the deepeſt and darkeſt kind; and that, inſtead of taking one pigment for each colour, it is better to take as many as can be got; for the greater diſcord there is of heterogeneous and diſcordant drugs, the more true and beautiful, he ſays, will the black be, and the more capable of uniting with all other colours, without ſuppreſſing them, and even without making them tawny.

Dr Lewis acquaints us, that by mixing different blue, red, and yellow colours, he has not been able to produce a perfect black; but has often obtained from them very dark colours, ſuch as may be called *brown-blacks*, or *gray-blacks*; ſuch as we commonly ſee in the dark

* See *Dyeing*.

Colour-making.

dark parts of paintings, and ſuch as the charcoal and ſoot blacks appear when diluted a little. The ingredients being each of a dark deep colour is a very neceſſary condition; for bright blues, bright reds, and bright yellows, mixed in ſuch proportions that neither colour prevailed, produced only a gray. In effect, all compoſitions of this kind, phyſically conſidered, can be no other than grays, or ſome of the intermediate tints between whiteneſs and darkneſs; and theſe grays will be ſo much the lighter or darker as the component colours of themſelves are bright or dark.

With regard to the extraction of the colouring matter from the different kinds of vegetables commonly to be met with of all colours, this would certainly be a very valuable acquiſition, could the colours ſo procured be made durable. On this ſubject nothing hath yet appeared more ſatisfactory than what is delivered by Dr Lewis in his notes on Neumann's chemiſtry. His obſervations are curious, but promiſe very little ſucceſs to any who ſhall attempt to fix theſe vegetable colours.

35
Dr Lewis's experiments on vegetable colours.

“ Among the infinite variety of colours (ſays he), which glow in the flowers of plants, there are very few which have any durability, or whoſe fugitive beauty can be arreſted by art, ſo as to be applied to any valuable purpoſes. The only permanent ones are the yellow, the red, the blue; and all the intermediate ſhades of purple, crimſon, violet, &c. are extremely periſhable. Many of theſe flowers loſe their colours on being barely dried; eſpecially if they are dried ſlowly, as has been uſually directed, in a ſhady, and not warm place. The colours of all of them periſh on keeping even in the cloſeſt veſſels. The more haſtily they are dried, and the more perfectly they are ſecured from the air, the longer they retain their beauty. The colouring matter extracted and applied on other bodies is ſtill more periſhable: oftentimes it is changed or deſtroyed in the hands of the operator.

“ The colour of many blue flowers is extracted by infuſion in water; but there are ſome from which water gains only reddiſh or purpliſh blue. Of thoſe that have been tried there is not one which gives any blue tincture to ſpirituous liquors: ſome give no colour at all, and ſome a reddiſh one. The juice preſſed out from the freſh flowers is for the moſt part blue. The blue juices and infuſions are changed red by all acids. The muriatic acid ſeems to ſtrike the moſt florid red. The flowers themſelves, macerated in acid liquors, impart alſo a deep red tincture. Alkalies, both fixed and volatile, and lime-water, change them to a green. Thoſe infuſions of the juices which have nothing of the native colour of the flowers, ſuffer the ſame changes from the addition of acid and alkaline liquors: even when the flowers have been kept till their colour is loſt, infuſions made from them acquire ſtill a red colour from the one, and a green from the other, though in a leſs degree than when the flowers were freſh. The red colour produced by acids is ſcarcely more durable than the original blue: applied upon other bodies and expoſed to the air, it gradually degenerates into a faintiſh purple, and at length diſappears, leaving hardly any ſtain behind. The green produced by alkalies changes to a yellow, which does not fade ſo ſoon. The green, by lime-water, is more permanent and more beautiful; green lakes, prepared from theſe flowers by lime-water, have been uſed as pigments by the painter. The flowers of cyanus have been greatly recommended, as affording elegant and durable blue pigments; but I have never been able to extract from them any blue colour at all. They retain their colour indeed, when haſtily dried, longer than ſome other blue flowers; but they communicate nothing of it to any kind of menſtruum. Infuſions of them in watery ſpirituous, and oily liquors, are all of them more or leſs of a reddiſh caſt, without any tendency to blue. Alum, which is ſaid to heighten and preſerve their blue colour, changes it, like that of other blue flowers, to a purpliſh red; acids to a deep red; alkalies and lime water to a green: ſolution of tin added to the watery infuſion, turns it to a fine crimſon; on ſtanding, a beautiful red fæcula ſubſides, but it loſes all its colour as ſoon as it is dry. The watery infuſion, inſpiſſated to the conſiſtence of an extract, appears of a dark reddiſh brown: an extract made with rectified ſpirit is of a purpliſh colour. The colour of both extracts ſpread thin, and expoſed to the air, quickly fades. The flowers employed in theſe experiments were thoſe of the common blue-bottle of the corn-fields.

“ Red flowers readily communicate their own red colour to watery menſtrua; among thoſe that have been tried, there is not one exception. Thoſe of a full red colour give to rectified ſpirit alſo a deep red tincture, brighter, though ſomewhat paler, than the watery infuſion: but the lighter red flowers, and thoſe which have a tendency to purpliſh, impart very little colour to ſpirit, and ſeem to partake more of the nature of the blue flowers than of the pure red. Infuſions of red flowers are ſuppoſed to be heightened by acids, and turned green by alkalies, like thoſe of the blue; but this is far from being univerſal. Among thoſe I have examined, the roſe-colours and purpliſh reds were changed nearly in the ſame manner as the blues; but the full deep reds were not. The deep infuſion of red poppies is changed by alkalies, not to a green, but to duſky purple.

“ The colours of yellow flowers, whether pale or deep, are in general durable. Many of them are as much ſo, perhaps, as any of the native colours of vegetables. The colour is extracted both by water and by ſpirit. The watery infuſions are the deepeſt. Neither alkalies nor acids alter the ſpecies of the colour; though both of them vary its ſhade; acids rendering it paler, and alkalies deeper; alum likewiſe conſiderably heightens it, though not ſo much as alkalies. An infuſion of the flowers, made in alkaline ley, precipitated by alum, gives a durable yellow lake. In ſome of the deep reddiſh yellow, or orange-coloured flowers, the yellow matter ſeems to be of the ſame kind with that of the pure yellow flowers, but the red to be of a different kind from the pure red ones; watery menſtrua take up only the yellow, and leave the red, which may afterwards be extracted by alcohol, or by water acuated by fixed alkaline ſalt. Such particularly are the ſaffron-coloured flowers of carthamus. Theſe, after the yellow matter has been extracted by water, are ſaid to give a red tincture to ley; from which, on ſtanding at reſt for ſome time, a deep bright red fæcula ſubſides; called from one of the names of the plant which produces it, *ſaſſlower* ; and from the countries whence it is commonly brought to us, *Spaniſh-red*, and *China-lake*. This pigment impregnates alcohol with a beautiful red tincture, but communicates no colour to water. I have endeavoured to ſeparate, by the ſame treatment, the red matter of ſome of the other reddiſh yellow flowers, as thoſe of garden marigold, but without ſucceſs. Plain water extracted a yellow colour, and alkaline ley extracted afterwards only a paler yellow : though the digeſtions were continued till the flowers had loſt their colour, the tinctures were no other than yellow, and not ſo deep as thoſe obtained from the pure yellow flowers. The little yellow flocculi, which in ſome kinds of flowers are collected into a compact round diſc, as in the daiſy and corn marigold, agree, ſo far as they have been examined, with the expanded yellow petala. Their colour is affected in the ſame manner by acids, by alkalies, and by alum ; and equally extracted by water and by ſpirit. But the yellow farina, or fine duſt, lodged on the tips of the ſtamina of flowers, appears to be of a different kind. It gives a fine bright yellow to ſpirit, and a duller yellow to water ; the undiſſolved part proving in both caſes of a pale yellowiſh white. Both the watery and ſpirituous tinctures were heightened by alkaline liquors, turned red by acids, and again to a deep yellow on adding more of the alkali : I know no other vegetable yellow that is turned red by acids.

" White flowers are by no means deſtitute of colouring matter. Alkaline lixivia extract from ſome of them a green tincture, and change their colourleſs expreſſed juices to the ſame colour ; but I have not obſerved that they are turned red by acids. The flowers of the common wild convolvulus or bind-weed, which in all their parts are white, give a deep yellow or orange tincture to plain water ; which, like the tinctures of flowers that are naturally of that colour, is rendered paler by acids, heightened a little by alum, and more conſiderably by alkaline ſalts. The vapours of the volatile ſulphuric acid, or of burning ſulphur, which whiten or deſtroy the colour of the coloured flowers, make no change in the white.

36
Colours from fruits.

" The red juices of fruits, as currants, mulberries, elder-berries, morello, black cherries, &c. gently inſpiſſated to dryneſs, diſſolve again almoſt totally in water, and appear nearly of the ſame red colour as at firſt. Rectified ſpirit extracts the tinging particles, leaving a conſiderable portion of mucilaginous matter undiſſolved ; and hence the ſpirituous tincture proves of a brighter colour than the watery. The red ſolutions, and the juices themſelves, are ſometimes made dull, and ſometimes more florid, by acids, and generally turned purpliſh by alkalies. The colours of theſe juices are for the moſt part periſhable. They reſiſt, indeed, the power of fermentation, and continue almoſt unchanged, after the liquor has been converted into wine ; but when the juice is ſpread thin upon other bodies, exſiccated, and expoſed to the air, the colour quickly alters and decays : the bright lively red changes the ſooneſt : the dark dull red ſtain from the juice of the black cherry, is of conſiderable durability. The fruit of the American opuntia or prickly pear, the plant upon which the cochineal inſect is produced is perhaps an exception : This bright red fruit, according to Labat, gives a beautiful red dye. Some experiments, however, made upon the juice of that fruit, as brought into England, did not promiſe to be of any great advantage ; but the particulars I cannot now recollect.

" The ripe berries of buckthorn ſtain paper of a green colour. From theſe is prepared the ſubſtance called *ſap-green*, a pigment ſufficiently durable, readily ſoluble in water, but not miſcible with oil. The berries dried while green, and macerated in alum-water, are ſaid to yield a yellow pigment ; and when they have grown over ripe ſo as to fall off ſpontaneouſly, a purple one. It is ſaid that the berry of the heliotropum tricoccum, which grows wild about Montpelier, ſtains paper of a green colour, and that this green turns preſently to a blue : that the common blue paper receives its colour from this juice : and that the red rags called *turnſol*, employed for colouring wines and other liquors, are tinctured by the ſame juice turned red by acids. According to M. Niſſole of the French academy of ſciences (as quoted by Savary in his Dictionnaire de Commerce), the following juice is obtained, not from the berries, but from tops of the plant gathered in Auguſt, ground in mills, and then committed to the preſs. The juice is expoſed to the ſun about an hour, the rags dipt in it, dried in the ſun, moiſtened by the vapour which ariſes during the ſlacking of quicklime with urine, then dried again in the ſun, and dipped again in the juice. The Dutch and others are ſaid to prepare turnſol rags, and turnſol in the maſs, from different ingredients, among which archil is a principal one.

" In ſome plants, peony for inſtance, the ſeeds at a certain point of maturity are covered with a fine ſhining red membrane. The pellicles of the ſeeds of a certain American tree afford the red maſſes brought into Europe under the names of *annotto*, *orlean*, and *raucou**. Mr Pott, in the Berlin Memoirs for the year 1752, mentions a very extraordinary property of this concrete. ' With ſulphuric acid it produces a blue colour, of extreme beauty ; but with this capital defect, that all ſalts and liquors, and even common water, deſtroy it.' The ſpecimen of annotto, which I examined, was not ſenſibly acted upon by ſulphuric acid ; it received no change in its own colour, and communicated none to the liquor. Nor did any viſible change enſue upon dropping the acid into tinctures of annotto made in water, or in ſpirit.

* See *Annotto*.

37
Colours from leaves.

" The green colour of the leaves of plants is extracted by rectified ſpirit of wine and by oils. The ſpirituous tinctures are generally of a fine deep green, even when the leaves themſelves are dull-coloured, or yellowiſh, or hoary. The colour, however, ſeldom continues long even in the liquor ; much leſs when the tinging matter is ſeparated in a ſolid form, and expoſed with a large ſurface to the air. The editor of the Wirtemberg Pharmacopœia obſerves, that the leaves of acanthus, brankurſine, or bear's-breach, give a more durable green tincture to ſpirit than thoſe of any other herb. Alkalies heighten the colour both of the tinctures and green juices ; acids weaken, deſtroy, or change it to a browniſh : lime water improves both the colour and durability : by means of lime, not inelegant green lakes are procurable from the leaves of acanthus, lily of the valley, and ſeveral other plants.

There are very few herbs which communicate any ſhare of their green colour to water; perhaps none that give a green of any conſiderable deepneſs. It is ſaid, however, that the leaves of ſome plants give a green dye to woollen, without the addition of any other colouring matter; particularly thoſe of the wild chervil, or cow-weed, the common ragwort, and devil's-bit. The leaves of many kinds of herbs and trees give a yellow dye to wool or woollen cloth that has been previouſly boiled with a ſolution of alum and tartar. Weld, in particular, affords a fine yellow, and is commonly made uſe of for this purpoſe by the dyers, and cultivated in large quantity in ſome parts of England. There is no colour for which we have ſuch plenty of materials as for yellow. M. Hellot obſerves that all leaves, barks, and roots, which on being chewed diſcover a ſlight aſtringency, as the leaves of the almond, peach, and pear trees, aſh bark, (eſpecially that taken off after the firſt riſing of the ſap in the ſpring), the roots of wild patience, &c. yield durable yellows, more or leſs beautiful according to the length of time that the boiling is continued, and the proportions of alum and tartar in the preparatory liquor: that a large quantity of alum makes theſe yellows approach to the elegant yellow of weld: that if the tartar is made to prevail, it inclines them to an orange; that if the roots, barks, or leaves be too long boiled, the yellow proves tarniſhed, and acquires ſhades of brown." See the article Dyeing.

38 Production of indigo accounted for.

The moſt capital preparations from the leaves of plants, are thoſe of indigo, and weld; which are both very much uſed in dyeing, though the firſt only in painting *. Both the indigo and woad plants, give out their colour, by proper management, to water, in form of a blue fæcula or lake. M. Hellot ſuſpects that a like blue fæcula is procurable from many other vegetables. Blue and yellow blended together, compoſe a green. He ſuppoſes the natural greens in vegetables to be compounded in like manner of theſe two colours; and that the blue is oftentimes the moſt permanent, ſo as to remain entire after the putrefaction or deſtruction of the yellow. The theory is ſpecious, and perhaps juſt: we know of no other that accounts in any degree for the production of the indigo and woad blue. Dr Lewis, however, informs us, that he never was able to produce the leaſt appearance of either blue or yellow from any of the plants he tried by treating them in the manner uſed for the preparation of indigo.

39 Colours from moſſes.

There are ſundry moſſes, which in their natural ſtate, like the indigo and woad plants, promiſe nothing of the elegant colours that can be extracted from them by art. The moſt remarkable of theſe is archil; for the preparation of which, and the colours that may be produced from it, ſee the article. Linnæus ſuſpects that there are ſeveral other more common moſſes from which valuable colours might be extracted: a quantity of ſea-moſs, having rotted in heaps on the ſhore, he obſerved the liquor in the heaps to be as red as blood; the ſea-water, the ſun, and the putrefaction, having brought out the colour. Mr Kalm, in an appendix to Linnæus's paper, in 1745, mentions two ſorts of moſſes actually employed in Sweden for dyeing woollen red: one is the lichenoides coralliforme apicibus coccineis of Ray's Synopſis; the other the lichenoides tartareum, farinaceum, ſcutellarum umbone fuſco, of Dillenius. This laſt is a white ſubſtance like meal clotted together, found on the ſides and tops of hills. It is ſhaved off from the rocks after rain, purified from the ſtony matters intermixed with it by waſhing with water, then dried in the ſun, ground in mills, and again waſhed and dried: it is then put into a veſſel with urine, and ſet by for a month: a little of this tincture added to boiling water makes the dyeing colour. In the ſame Tranſactions for the year 1754, there is an account of another moſs which, prepared with urine, gives a beautiful and durable red or violet dye to wool and ſilk. This is the lichen foliaceus umbilicatus ſubtus lacunenſis, Linn. flor. Suec. It grows upon rocks, and is readily diſtinguiſhable from others of that claſs, by looking as if burnt or parched, conſiſting of leaves as thin as paper, convex all over on the upper ſide, with correſponding cavities underneath, adhering firmly to the ſtones by a little root under the leaves, and coming aſunder, when dry, as ſoon as touched. It is gathered after rain, as it then holds beſt together, and parts eaſieſt from the ſtone. In France, a cruſtaceous moſs, growing upon rocks in Auvergne, is prepared with lime and urine, and employed by the dyers as a ſuccedaneum for the Canary archil, to which it is ſaid to be very little inferior. M. Hellot relates, that he has met with ſeveral other moſſes, which, on being prepared in the ſame manner, acquire the ſame colour. The moſt expeditious way, he ſays, of trying whether a moſs will yield an archil or not, is to moiſten a little of it with a mixture of equal parts of ſpirit of ſal ammoniac and ſtrong lime water, and add a ſmall proportion of crude ſal ammoniac. The glaſs is then to be tied over with a piece of bladder, and ſet by for three or four days. If the moſs is of the proper kind, the little liquor which runs from it upon inclining the veſſel, will appear of a deep crimſon colour; and this afterwards evaporating, the plant itſelf acquires the ſame colour. Dr Lewis informs us, that he has tried a good number of the common moſſes, many both of the cruſtaceous and foliaceous kind, and not a few of the fungi; as alſo the herbs chamomile and milfoil, which yield a blue eſſential oil; and thyme, whoſe oil becomes blue by digeſtion with volatile ſpirits; but never met with any that yielded a colour like archil. Moſt of them gave a yellow or reddiſh brown tincture. A few gave a deep red colour to the liquor: but when diluted, it ſhowed a yellowiſh caſt, and when applied on cloth it gave only a yellowiſh red.

40 Some blue flowers may probably yield permanent colours.

To theſe obſervations we ſhall only add, that though in general the blue colours of flowers are exceedingly periſhable, there ſeem to be at leaſt two exceptions to this rule; for the blue flowers of iris, or flower-de-luce, and thoſe of columbine, when treated with ſolution of tin, yielded a colour tolerably permanent. Indeed, when experiments are made with a view to extract the colour from any part of a vegetable, it will always be proper to try whether it can bear a mixture with this ſolution. If the colour is not deſtroyed by it, there is a very great probability that the ſolution will, by proper management, preſerve, and give a durability to it, which could ſcarce be obtained by

* See *Indigo* and *Woad*.

by any other method. It muſt, however, be obſerved, that there are ſeveral ſubſtances uſed in colour-making, which ſolution of tin cannot bear to be mixed with. Theſe are principally ſugar of lead and cream of tartar, as well as all the calcareous earths and alkaline ſalts. With alum it may be mixed very ſafely, and is in many caſes the better for it. 41 Colours from roots. The roots of plants, however, ſeem to promiſe more durability of colour than the upper parts. We have ſeen a blue colour of conſiderable durability and brightneſs prepared from the roots of common radiſhes by expreſſing the juice, combining it with tobacco-pipe clay, and brightening it with a little alum. The root of the red beet is alſo ſaid to yield a durable colour of a beautiful red, inclining to ſcarlet; but this we cannot affirm from our own experience.

42 Colours for maps. With regard to liquid colours for maps, &c. we apprehend there can be very little difficulty in preparing all the poſſible varieties of them, if what we have above laid down is attended to. The only colour with which there can be any difficulty is *blue*; but the common ſolution of indigo in alkalies or acids may be made to anſwer this purpoſe, though, on account of their ſtrongly ſaline quality, they are not very proper. A very curious method of procuring a beautiful tranſparent blue colour is by extracting the colouring matter from Pruſſian blue, by means of a cauſtic alkali. This, when laid upon paper, appears of a dirty brown colour; but if waſhed over with a weak ſolution of green vitriol, is inſtantly changed to a moſt beautiful blue. This ſeems to afford a method of procuring blue tranſparent colours of greater beauty than they are uſually met with.—See ſpecimens of tranſparent colours prepared according to the above rules, on the *Chart* ſubjoined to History.

COLOURING, among painters, the manner of applying and conducting the colour of a picture; or the mixtures of light and ſhade, formed by the various colours employed in painting. See Painting.

Colouring of Glaſs. See Glass.

Colouring of Porcelain. See Porcelain.

COLT, in *Zoology*, a general name for the young of the horſe kind: the male being likewiſe, for diſtinction's ſake, called a *horſe-colt*; the female, a *filly*.

Sportſman's Dictionary. After the colts have been foaled, you may ſuffer them to run with the mare till about Michaelmas, ſooner or later, according as the cold weather comes in; then they muſt be weaned; though ſome perſons are for having them weaned after Martinmas, or the middle of November. The author of the *Complete Horſeman* is of opinion, that the reaſon why moſt foals advance ſo ſlowly, and are not capable of ſervice till they are ſix or ſeven years old, is becauſe they have not ſucked long enough; whereas, if they had ſucked the whole winter over, they would be as good at four or five years old as they are now at eight.

They ought now to be kept in a convenient houſe, with a low rack and manger for their hay and oats, which muſt be ſweet and good; with a little wheaten bran mixed with the oats to cauſe them to drink, and to keep their bodies open. But, ſince there are ſome who allege, that oats make foals become blind, or their teeth crooked; the ſame author is of opinion, that oats will wear their teeth, and make them the ſooner to change, and alſo to raze; therefore he judges it to be the beſt way to break them in a mill, becauſe, that by endeavouring with their jaws to bruiſe and chew them, they ſtretch and ſwell their eye and nether-jaw veins, which ſo attract the blood and humours that they fall down upon the eyes, and frequently occaſion the loſs of them; ſo that it is not the heating quality of the oats, but the difficulty in chewing, that is the cauſe of their blindneſs.

Further, colts thus fed with grain do not grow thickiſh upon their legs, but grow broader and better knit than if they had eaten nothing but hay and bran, and will endure fatigue the better. But above all, they muſt be kept from wet and cold, which are hurtful to them, nothing being more tender than they are. For proof of this, take a Spaniſh ſtallion, and let him cover two mares, which for age, beauty, and comelineſs may admit of no difference between them; and if they produce both horſe-colts, or both fillies, which is one and the ſame thing, let one run abroad, and the other be houſed every winter, kept warm, and ordinarily attended; and that colt that has been kept abroad ſhall have large fleſhy ſhoulders, flabby and gouty legs, weak paſterns, and ill hoofs; and ſhall be a dull heavy jade, in compariſon to the other which is houſed, and orderly kept; and which will have a fine forehead, be fine ſhaped, and have good legs and hoofs, and be of good ſtrength and ſpirit; by which you may know, that to have the fineſt ſtallion, and the moſt beautiful mare, is nothing, if they are ſpoiled in the breeding up. It is worth obſervation, that ſome foals, under ſix months old, though their dams yield plenty of milk, yet decay daily, and have a cough, proceeding from certain pellicles or ſkins that breed in their ſtomachs, which obſtruct their breathing, and at laſt deſtroy them entirely. To remedy this malady, take the bag wherein the colt was foaled, dry it, and give him as much of it in milk as you can take up with three fingers; but if you have not preſerved the bag, procure the lungs of a young fox, and uſe it inſtead of the aforeſaid powder.

It will be proper to let the colts play an hour or two in ſome court-yard, &c. when it is fair weather, provided you put them up again carefully, and ſee that they take no harm. When the winter is ſpent, turn them into ſome dry ground, where the graſs is ſhort and ſweet, and where there is good water, that they may drink at pleaſure; for it is not neceſſary that a colt ſhould fill his belly immediately, like a horſe that labours hard. The next winter you may take them into the houſe, and uſe them juſt as you do your other horſes; but let not your horſe-colts and fillies be kept together after the firſt year. This method may be obſerved every ſummer and winter till you break them, which you may do after they have been three years old; and it will be a very eaſy thing, if you obſerve the aforeſaid method of houſing them; for ordering them the ſecond year as you do your other horſes, they will be ſo tame and gentle, that you need not fear their leaping, plunging, kicking, or the like; for they will take the ſaddle quietly. As for all thoſe ridiculous methods of beating and curbing them, they are in effect ſpoiling them, whatever they call it, in ploughed fields, deep ways, or the like; inſtead of which, let the rider ſtrive to win them by gentle uſage, never correcting them but when it is neceſſary, and then with judgment and moderation. You will not need a caveſſon of cord, which is a head ſtrain, nor a pad of ſtraw; but only a common ſaddle, and a common caveſſon on his noſe, ſuch as other horſes are ridden with; but it ought to be well lined with double leather; and, if you pleaſe, you may put on his mouth a watering bit, but without reins, only the head-ſtall, and this but for a few days; and then put on ſuch a bit as he ſhould be always ridden with; and be ſure not to uſe ſpurs for ſome time after backing. Take notice, that as yearlings muſt be kept abroad together, ſo thoſe of two years old together; and the like for thoſe of three yearlings; which ordering is moſt agreeable to them.

In order to make him endure the ſaddle the better, the way to make it familiar to him will be by clapping the ſaddle with your hand as it ſtands upon his back, by ſtriking it, and ſwaying upon it, dangling the ſtirrups by his ſides, rubbing them againſt his ſides, and making much of them, and bringing him to be familiar with all things about him; as ſtraining the crupper, faſtening and looſening the girths, and taking up and letting out the ſtirrups. Then, as to his motion, when he will trot with the ſaddle obediently, you may waſh a trench of a full mouth, and put the ſame into his mouth, throwing the reins over the forepart of the ſaddle, ſo that he may have a full feeling of it; then put on a martingale, buckled at ſuch a length that he may but juſt feel it when he jerks up his head; then take a broad piece of leather, and put it about his neck, and make the ends of it faſt by plaiting it, or ſome other way, at the withers, and the middle part before his weaſands, about two handfuls below the thropple, betwixt the leather and his neck; let the martingale paſs ſo, that when at any time he offers to duck, or throw down his head, the caveſſon being placed upon the tender griſtle of his noſe, may correct and puniſh him; which will make him bring his head to, and form him to an abſolute rein; trot him abroad, and if you find the reins or martingale grow ſlack, ſtraiten them, for when there is no feeling, there is no virtue.

Colt-Evil, among farriers. See Farriery.

Colt-Taming, is the breaking of a colt ſo as to endure a rider. Colts are moſt eaſily broken at three or four years of age; but he who will have patience to ſee his horſe at full five, will have him much more free of diſeaſes and infirmities than if he was broken ſooner.

Preparatory to their breaking for the ſaddle, they ſhould be uſed to familiar actions, as rubbing, clawing, haltering, leading to water, taking up their feet, knocking their hoofs, &c. In order to bridle and ſaddle a colt, when he is made a little gentle, take a ſweet watering trench, waſhed and anointed with honey and ſalt, which put into his maſh, and ſo place it that it may hang about his tuſh; then offer him the ſaddle, but take care not to frighten him with it. Suffer him to ſmell at it, to be rubbed with it, and then to feel it; after that fix it, and gird it faſt, and make that motion the moſt familiar to him to which he ſeems moſt averſe. Being thus ſaddled and bridled, lead him out to water, and bring him in again; when he has ſtood reined upon the trench an hour or more, take off the bridle and ſaddle, and let him go to his meat till the evening, and then lead him out as before; and when you carry him in again to ſet him up, take off his ſaddle gently, clothing him for the night.

COLTIE, a term uſed by timber-merchants, for a defect or blemiſh in ſome of the annular circles of a tree, whereby its value is much diminiſhed.

COLUBER, in *Zoology*, a genus of ſerpent belonging to the order of amphibia. See Ophiology *Index*.

COLUMB-KILL. See Jona.

COLUMBA, the Pigeon, in *Ornithology*, a genus of birds belonging to the order of paſſeres. See Ornithology *Index*.

COLUMBA, St, in alluſion to whoſe name the iſland of Jona (one of the Hebrides), received its name; *Jona* being derived from a Hebrew word ſignifying a dove. This holy man, inſtigated by his zeal, left his native country, Ireland, in the year 565, with the pious deſign of preaching the goſpel to the Picts. It appears that he left his native ſoil with warm reſentment, vowing never to make a ſettlement within ſight of that hated iſland. He made his firſt trial at Oranſay; and finding that place too near to Ireland, ſucceeded to his wiſh at *Hy*, for that was the name of Jona at the time of his arrival. He repeated here the experiment on ſeveral hills, erecting on each a heap of ſtones; and that which he laſt aſcended is to this day called *Carnan-chul-reh-Eirium*, or "The eminence of the back turned to Ireland."

Columba was ſoon diſtinguiſhed by the ſanctity of his manners: a miracle that he wrought ſo operated on the Pictiſh king Bradeus, that he immediately made a preſent of the little iſle to the ſaint. It ſeems that his majeſty had refuſed Columba an audience; and even proceeded ſo far as to order the palace-gates to be ſhut againſt him: but the ſaint, by the power of his word, inſtantly cauſed them to fly open. As ſoon as he was in poſſeſſion of Jona, he founded a cell of monks, borrowing his inſtitutions from a certain oriental monaſtic order. It is ſaid that the firſt religious were canons regular, of whom the founder was the firſt abbot; and that his monks, till the year 716, differed from thoſe of the church of Rome, both in the obſervation of Eaſter and in the clerical tonſure. Columba led here an exemplary life, and was highly reſpected for the ſanctity of his manners for a conſiderable number of years. He is the firſt on record who had the faculty of *ſecond ſight*, for he told the victory of Aidan over the Picts and Saxons on the very inſtant it happened. He had the honour of burying in his iſland, Convallus and Kinnatil, two kings of Scotland, and of crowning a third. At length, worn out with age, he died in Jona in the arms of his diſciples; was interred there, but (as the Iriſh pretend) in after times tranſlated to Down; where, according to the epitaph, his remains were depoſited with thoſe of St Bridget and St Patrick.

Hi tres in *Duno* tumulo tumulantur in uno;
Brigida, Patricius, atque *Columba* pius.

But this is totally denied by the Scots; who affirm, that the contrary is ſhown in the life of the ſaint, extracted out of the Pope's library, and tranſlated out of the Latin into Erſe, by Father *Cailo haran*;

which decides in favour of Jona the momentous diſpute.

COLUMBANUS, a ſaint and a poet, was born in Ireland, and brought up to a religious life among the diſciples of St Columba. He made uncommon progreſs in learning; and very early in life diſtinguiſhed himſelf for poetical abilities, by the compoſition of a book of pſalms, and a number of moral poems, intended alſo to be ſet to muſic. Jonas, a writer of eccleſiaſtical hiſtory, mentions, that Columbanus belonged originally to a monaſtery of the name of *Benchor*. The ſame monaſtery is mentioned by St Bernard in his life of his friend St Malachi; and he relates that it ſent out a great number of monks, who ſpread over Europe. Columbanus paſſed from Britain into France, and founded the monaſtery of Luxeville near Beſançon. He had been kindly received and patronized by King Childebert; but he was afterwards expelled out of France by the wicked queen Brunichild. He retired to Lombardy in Italy, and was well received by King Argulphus. In Lombardy he again founded the monaſtery of Bobio. The *Regula Cœnobialis* and *Penitentialis*, which he eſtabliſhed in that monaſtery, have been publiſhed in the *Codex Regularum* compiled by the learned Holſtenius. He was contemporary with St Benedict. It was in the year 589 he went into France.

COLUMBARIA, in *Ancient Geography*, an iſland like a rock on the weſt of Sicily, oppoſite to Drepanum; ſaid by Zonares to have been taken from the Carthaginians by Numerius Fabius the conſul. Now *Columbara*, with a very ſtrong and almoſt impregnable citadel (Cluverius).

COLUMBIC ACID. See CHEMISTRY *Index*.

COLUMBINE. See AQUILEGIA, BOTANY *Index*.

COLUMBIUM, a new metal which was diſcovered in a mineral from North America. See CHEMISTRY *Index*.

COLUMBO-ROOT, an article lately introduced into the materia medica, the natural hiſtory of which is not yet well known. According to Dr Percival's account, it grew originally on the continent of America, from whence it was tranſplanted to Columbo, a town in Ceylon, which gives name to, and ſupplies all India with it. The inhabitants of theſe countries have for a long time uſed it in diſorders of the ſtomach and bowels. They carry it about with them, and take it ſliced or ſcraped in Madeira wine. This root comes to us in circular pieces, which are from half an inch or an inch to three inches in diameter; and divided into *fruſta*, which meaſure from two inches to one quarter of an inch. The ſides are covered with a thick corrugated bark, of a dark brown hue on its external ſurface, but internally of a light yellow colour. The ſurfaces of the tranſverſe ſections appear very unequal, higheſt at the edges, and forming a concavity towards the centre. On ſeparating this ſurface, the root is obſerved to conſiſt of three lamina, viz. the cortical, which in the larger roots, is a quarter of an inch thick; the ligneous, about half an inch; and the medullary, which forms the centre, and is near an inch in diameter. This laſt is much ſofter than the other parts, and, when chewed, ſeems mucilaginous; a number of ſmall fibres run longitudinally through it, and appear on the ſurface. The cortical and ligneous parts are divided by a black circular line. All the thicker pieces have ſmall holes drilled through them, for the convenience of drying. Columbo-root has an aromatic ſmell, but is diſagreeably bitter, and ſlightly pungent to the taſte, ſomewhat reſembling muſtard-ſeed, when it has loſt, by long keeping, part of its eſſential oil. Yet, though ungrateful to the taſte, when received into the ſtomach, it appears to be corroborant, antiſeptic, ſedative, and powerfully antiemetic. In the cholera morbus it alleviates the violent *tormina*, checks the purging and vomiting, corrects the putrid tendency of the bile, quiets the inordinate motions of the bowels, and ſpeedily recruits the exhauſted ſtrength of the patient. It was adminiſtered to a great number of patients, ſometimes upwards of 20 in a day, afflicted with the cholera morbus, by Mr Johnſon of Cheſter, in 1756. He generally found that it ſoon ſtopped the vomiting, which was the moſt fatal ſymptom, and that the purging and remaining complaints quickly yielded to the ſame remedy. The doſe he gave was from half a drachm to two drachms of the powder, every three or four hours, more or leſs according to the urgency of the ſymptoms. Though this medicine poſſeſſes little or no aſtringency, it has been obſerved to be of great ſervice in diarrhœas, and even in the dyſentery. In the firſt ſtage of theſe diſorders, where aſtringents would be hurtful, Columbo-root may be perſcribed with ſafety; as, by its antiſpaſmodic powers, the irregular actions of the primæ viæ are corrected. But as a cordial, tonic, and antiſeptic remedy, it anſwers better when given towards their decline. Its efficacy has alſo been obſerved in the vomitings which attend the bilious cholic; and in ſuch caſes, where an emetic is thought neceſſary, after adminiſtering a ſmall doſe of ipecacuan, the ſtomach may be waſhed with an infuſion of Columbo-root. This will tend to prevent thoſe violent and convulſive retchings which in irritable habits abounding with bile are ſometimes excited by the mildeſt emetic. In bilious fevers, 15 or 20 grains of this root, with an equal or double quantity of vitriolated tartar, given every four, five, or ſix hours, produce very beneficial effects. From its efficacy in theſe bilious diſeaſes of this country, it is probable that it may be uſeful in the yellow fever of the Weſt Indies, which is always attended with great ſickneſs, violent retchings, and a copious diſcharge of bile. The vomiting recurs at ſhort intervals, often becomes almoſt inceſſant, and an incredible quantity of bile is ſometimes evacuated in a few hours. Children during dentition are often ſubject to ſevere vomitings and diarrhœas. In theſe caſes the Columbo-root is an uſeful remedy, and hath often procured almoſt inſtant relief, when other remedies often efficacious have been tried in vain. This root is alſo extremely benefical in a languid ſtate of the ſtomach, attended with want of appetite, indigeſtion, nauſea, and flatulence. It may be given either in ſubſtance, with ſome grateful aromatic, or infuſed in Madeira wine. Habitual vomiting, when it proceeds from a weakneſs or irritability of the ſtomach, from an irregular gout, acidities, acrimonious bile, or an increaſed and depraved ſecretion of the pancreatic juice, is greatly relieved by the uſe of Columbo-root, in conjunction with aromatics, chalybeates, or the teſtaceous powders. In the nauſea and vomiting occaſioned by pregnancy, an infuſion of Columbo-root ſucceeds better than any other medicine that hath been tried.

From Dr Percival's experiments on this root, it appears, that rectified ſpirit of wine extracts its virtues in the greateſt perfection. The watery infuſion is more periſhable than that of other bitters. In 24 hours a copious precipitation takes place; and in two days it becomes ropy, and even muſty. The addition of orange peel renders the infuſion of Columbo-root leſs ungrateful to the palate. An ounce of the powdered root, half an ounce of orange-peel, two ounces of French brandy, and 14 ounces of water, macerated 12 hours without heat, and then filtered through paper, afford a ſufficiently ſtrong and tolerably pleaſant infuſion. The extract made firſt by ſpirit and then with water, and reduced by evaporation to a pilular conſiſtence, is found to be equal, if not ſuperior, in efficacy to the powder. As an antiſeptic, Columbo-root is inferior to the bark; but as a corrector of putrid gall, it is much ſuperior; whence alſo it is probable that it would be of ſervice in the Weſt India yellow fever. It alſo reſtrains alimentary fermentation, without impairing digeſtion, in which property it reſembles muſtard. Hence its great ſervice in preventing acidities. It hath alſo a remarkable power of neutralizing acids already formed. It doth not appear to have the leaſt heating quality; and therefore may be uſed with propriety and advantage in the phthiſis pulmonalis and in hectical caſes, to correct acrimony and ſtrengthen digeſtion. It occaſions no diſturbance, and agrees very well with a milk diet, as it abates flatulence, and is indiſpoſed to acidity.

COLUMBO, a maritime town of the iſland of Ceylon in the Eaſt Indies, ſeated on the ſouth-weſt part of its coaſt, and ſubject to the Dutch. E. Long. 68. 10. N. Lat. 7. 5.

COLUMBUS, or *Congregation of St Columbus*, a ſociety of regular canons, who formerly had 100 abbeys or monaſteries in the Britiſh iſles.

COLUMBUS, *Chriſtopher*, a Genoeſe, the celebrated navigator, and firſt diſcoverer of the iſlands of America, was a ſubject of the republic of Genoa. Neither the time nor the place of his birth, however, are known with certainty; only he was deſcended of an honourable family, who, by various misfortunes, had been reduced to indigence. His parents were ſeafaring people; and Columbus having diſcovered, in his yearly youth, a capacity and inclination for that way of life, was encouraged by them to follow the ſame profeſſion. He went to ſea at the age of 14: his firſt voyages were to theſe ports in the Mediterranean frequented by the Genoeſe, after which he took a voyage to Iceland; and proceeding ſtill further north, advanced ſeveral degrees within the polar circle. After this, Columbus entered into the ſervice of a famous ſea captain of his own name and family. This man commanded a ſmall ſquadron, fitted out at his own expence; and by cruiſing, ſometimes againſt the Mahometans, and ſometimes againſt the Venetians, the rivals of his country in trade, had acquired both wealth and reputation. With him Columbus continued for ſeveral years, no leſs diſtinguiſhed for his courage than his experience as a ſailor. At length, in an obſtinate engagement off the coaſt of Portugal, with ſome Venetian caravals returning richly laden from the Low Countries, the veſſel on board which he ſerved took fire, together with one of the enemies ſhips to which it was faſt grappled. Columbus threw himſelf into the ſea, laid hold of a floating oar, and by the ſupport of it, and his dexterity in ſwimming, he reached the ſhore, though above two leagues diſtant.

After this diſaſter, Columbus repaired to Liſbon, where he married a daughter of Bartholemew Pereſtrello, one of the captains employed by Prince Henry in his early navigations, and who had diſcovered and planted the iſlands of Porto Santo and Madeira. Having got poſſeſſion of the journals and charts of this experienced navigator, Columbus was ſeized with an irreſiſtible deſire of viſiting unknown countries. In order to indulge it, he made a voyage to Madeira, and continued during ſeveral years to trade with that iſland, the Canaries, Azores, the ſettlements in Guinea, and all the other places which the Portugueſe had diſcovered on the continent of Africa.

By the experience acquired in ſuch a number of voyages, Columbus now became one of the moſt ſkilful navigators in Europe. At this time the great object of diſcovery was a paſſage by ſea to the Eaſt Indies. This was attempted, and at laſt accompliſhed, by the Portugueſe, by doubling the Cape of Good Hope. The danger and tediouſneſs of the paſſage, however, ſuppoſing it to be really accompliſhed, which as yet it was not, ſet Columbus on conſidering whether a ſhorter and more direct paſſage to theſe regions might not be found out; and, after long conſideration, he became thoroughly convinced, that, by ſailing acroſs the Atlantic ocean, directly towards the weſt, new countries, which probably formed a part of the vaſt continent of India, muſt infallibly be diſcovered. His reaſons for this were, in the firſt place, a knowledge he had acquired of the true figure of the earth. The continents of Europe, Aſia, and Africa, as far as then known, form but a ſmall part of the globe. It was ſuitable to our ideas, concerning the wiſdom and benificence of the Author of nature, to believe, that the vaſt ſpace, ſtill unexplored, was not entirely covered by a waſte and barren ocean, but occupied by countries fit for the habitation of man. It appeared likewiſe extremely probable, that the continent on this ſide the globe was balanced by a proportional quantity of land in the other hemiſphere. Theſe conjectures were confirmed by the obſervations of modern navigators. A Portugueſe pilot having ſtretched farther to the weſt than was uſual at that time, took up a piece of timber, artificially carved, floating upon the ſea; and as it was driven towards him by a weſterly wind, he concluded that it came from ſome unkown land ſituated in that quarter. Columbus's brother-in law had found to the weſt of the Madeira iſles a piece of timber faſhioned in the ſame manner, and brought by the ſame wind; and had ſeen alſo canes of an enormous ſize floating upon the waves, which reſembled thoſe deſcribed by Ptolemy, as productions peculiar to the Eaſt Indies. After a courſe of weſterly winds, trees torn up by the roots were often driven upon the coaſt of the Azores; and at one time the dead bodies of two men, with ſingular features, which reſembled neither the inhabitants of Europe nor Africa, were caſt aſhore there. The moſt cogent reaſon, however, was a miſtaken notion of the ancient geographers concerning the immenſe extent of the continent of India. Though hardly any of them had penetrated beyond the river Ganges, ſome Greek writers had ventured to deſcribe the provinces beyond that river, which they repreſented as regions of an immenſe extent. Cteſias affirmed that India was as large as all the reſt of Aſia. Oneſicritus, whom Pliny the naturaliſt follows, contended that it was equal to a third part of the habitable earth. Nearchus aſſerted that it would take four months to march from one extremity of it to the other in a ſtraight line. The journal of Marco Polo, who travelled into Aſia in the 13th century, and who had proceeded towards the eaſt far beyond the limits to which any European had ever advanced, ſeemed alſo ſo much to confirm theſe accounts, that Columbus was perſuaded that the diſtance from the moſt weſterly part of Europe to the moſt eaſterly part of Aſia was not very conſiderable; and that the ſhorteſt, as well as moſt direct courſe to the remote regions of the eaſt, was to be found by ſailing due weſt.

In 1474, Columbus communicated his ideas on this ſubject to one Paul a phyſician in Florence, a man eminent for his knowledge in coſmography. He approved of the plan, ſuggeſted ſeveral facts in confirmation of it, and warmly encouraged Columbus to perſevere in an undertaking ſo laudable, and which muſt redound ſo much to the honour of his country and the benefit of Europe. Columbus, fully ſatisfied of the truth of his ſyſtem, was impatient to ſet out on a voyage of diſcovery. The firſt ſtep towards this was to ſecure the patronage of ſome of the conſiderable powers of Europe capable of undertaking ſuch an enterpriſe. He applied firſt to the republic of Genoa; but his countrymen, ſtrangers to his abilities, inconſiderately rejected his propoſal as the dream of a chimerical projector, and thus loſt for ever the opportunity of reſtoring their commonwealth to its ancient luſtre. His next application was to the court of Portugal, where King John II. liſtened to him in the moſt gracious manner, and referred the conſideration of his plan to Diego Ortiz, biſhop of Ceuta, and two Jewiſh phyſicians, eminent coſmographers, whom he was accuſtomed to conſult in matters of this kind. Unhappily theſe were the perſons who had been the chief directors of the Portugueſe navigations, and had adviſed to ſearch for a paſſage to India by ſteering a courſe directly oppoſite to that which Columbus had recommended as ſhorter and more certain. They could not therefore approve of his propoſal, without ſubmitting to the double mortification of condemning their own theory, and of acknowledging his ſuperiority. The reſult of their conferences was, that they adviſed the king to fit out a veſſel privately, in order to attempt the propoſed diſcovery, by following exactly the courſe which Columbus ſeemed to point out. John forgetting on this occaſion the ſentiments of a monarch, meanly adopted this perfidious counſel. But the pilot choſen to execute Columbus's plan had neither the genius nor fortitude of its author. Contrary winds aroſe; no ſign of approaching land appeared; his courage failed; and he returned to Liſbon, execrating the project as equally extravagant and dangerous.

On diſcovering this diſhonourable tranſaction, Columbus immediately quitted Portugal, and applied to the king of Spain; but leſt he ſhould be here again diſappointed, he ſent his brother Bartholomew into England, to whom he had fully communicated his ideas, in order that he might negociate at the ſame time with Henry VII. who was reckoned one of the moſt ſagacious as well as opulent princes of Europe. Bartholomew was very unfortunate in his voyage: he fell into the hands of pirates, who ſtripped him of every thing, and detained him a priſoner for ſeveral years. At laſt he made his eſcape, and arrived in London, but in ſuch extreme indigence that he was obliged to employ himſelf, during a conſiderable time, in drawing and ſelling maps, in order to pick up as much money as would purchaſe a decent dreſs in which he might venture to appear at court. The propoſals were received by Henry with more approbation than by any monarch to whom they had hitherto been preſented.

Columbus himſelf made his propoſals to the king of Spain, not without many doubts of ſucceſs, which ſoon appeared to be well founded. True ſcience had as yet made ſo little progreſs in the kingdom of Spain, that moſt of thoſe to whom the conſideration of his plan was referred were utterly ignorant of the firſt principles on which he founded his hopes. Some, from miſtaken notions concerning the dimenſions of the globe, contended that a voyage to thoſe remote regions of the Eaſt which Columbus expected to diſcover, could not be performed in leſs than three years. Others concluded, that either he would find the ocean of infinite extent, according to the opinion of ſome ancient philoſophers; or that if he ſhould perſiſt in ſteering weſtwards beyond a certain point, the convex figure of the globe muſt infallibly prevent his return, and he muſt periſh in the vain attempt to unite the two oppoſite hemiſpheres, which nature had forever disjoined. Even without deigning to enter into any particular diſcuſſion, ſome rejected the ſcheme in general, upon the credit of a maxim made uſe of by the ignorant in all ages, "That it is preſumptuous in any perſon to ſuppoſe that he alone poſſeſſes knowledge ſuperior to all the reſt of mankind united." By continual diſappointments and delays, he was at laſt wearied out, and reſolved to repair to the court of England in perſon, in hopes of meeting with a favourable reception there. He had already made preparations for this purpoſe, and taken meaſures for the diſpoſal of his children during his abſence, when Juan Perez, the prior of the monaſtery of Rabida near Palos, in which they had been educated, earneſtly ſolicited him to defer his journey for a ſhort time. Perez was a man of conſiderable learning, and ſome credit with Queen Iſabella. To her therefore he applied; and the conſequence of his application was a gracious invitation of Columbus back to court, accompanied with the preſent of a ſmall ſum to equip him for the journey. Ferdinand, however, ſtill regarded the project as chimerical; and had the addreſs to employ, in this new negociation with him, ſome of the perſons who had formerly pronounced his ſcheme to be impracticable. To their aſtoniſhment, Columbus appeared before them with the ſame confident hopes of ſucceſs as formerly, and inſiſted on the ſame high recompenſe. He propoſed that a ſmall fleet ſhould be fitted out, under his command, to attempt the diſcovery; and demanded to be appointed perpetual and hereditary admiral and viceroy of all the ſeas and lands which he ſhould diſcover; and to have the tenth of the profits ariſing from them ſettled irrevocably upon him and his deſcendants for ever. At the ſame time he offered to advance the eighth part of the ſum neceſſary for accompliſhing his deſign, on condition that he ſhould be entitled to a proportional ſhare in the adventure. If the enterpriſe ſhould totally miſcarry, he made no ſtipulation for any reward or emolument whatever. Theſe demands were thought unreaſonable; Iſabella broke off the treaty ſhe had begun, and Columbus was once more diſappointed. He now reſolved finally to leave Spain; and had actually proceeded ſome leagues on his journey, when he was overtaken by a meſſenger from Iſabella, who had been prevailed upon by the arguments of Quintanilla and Santangel, two of Columbus's patrons, again to favour his undertakings. The negociation now went forward with all manner of facility and diſpatch; and a treaty with Columbus was ſigned on the 17th of April 1492. The chief articles of it were, that Columbus ſhould be conſtituted high admiral in all the ſeas, iſlands, and continents he ſhould diſcover, with the ſame powers and prerogatives that belonged to the high admiral of Caſtile within the limits of his juriſdiction. He was alſo appointed viceroy in all thoſe countries to be diſcovered; and a tenth of the products accruing from their productions and commerce was granted to him for ever. All controverſies or law-ſuits with reſpect to mercantile tranſactions were to be determined by the ſole authority of Columbus, or of judges to be appointed by him. He was alſo permitted to advance one eighth part of the expence of the expedition, and of carrying on commerce with the new countries; and was entitled, in return, to an eighth part of the profit. But though the name of Ferdinand was joined with Iſabella in this tranſaction, his diſtruſt of Columbus was ſtill ſo violent, that he refuſed to take any part in the enterpriſe as king of Arragon; and as the whole expence of the expedition was to be defrayed by the crown of Caſtile, Iſabella reſerved for her ſubjects of that kingdom an excluſive right to all the benefits which might accrue from its ſucceſs.

At laſt our adventurer ſet ſail with three ſmall ſhips, the whole expence of which did not exceed 4000l. During his voyage he met with many difficulties from the mutinous and timid diſpoſition of his men. He was the firſt who obſerved the variation of the compaſs, which threw the ſailors into the utmoſt terror. For this phenomenon Columbus was obliged to invent a reaſon, which, though it did not ſatisfy himſelf, yet ſerved to diſpel their fears, or ſilence their murmurs. At laſt, however, the ſailors loſt all patience; and the admiral was obliged to promiſe ſolemnly, that in caſe land was not diſcovered in three days he ſhould return to Europe. That very night, however, the iſland of San Salvador was diſcovered, which quickly put an end to all their fears. The ſailors were then as extravagant in the praiſe of Columbus as they had before been inſolent in reviling and threatening him. They threw themſelves at his feet, implored his pardon, and pronounced him to be a perſon inſpired by heaven with more than human ſagacity and fortitude, in order to accompliſh a deſign ſo far beyond the ideas and conception of all former ages. Having viſited ſeveral of the Weſt India iſlands, and ſettled a colony in Hiſpaniola *; he again ſet ſail for Spain; and after eſcaping great dangers from violent tempeſts, arrived at the port of Palos on the 15th of March 1493.

As ſoon as Columbus's ſhip was diſcovered approaching, all the inhabitants of Palos ran eagerly to the ſhore, where they received the admiral with royal honours. The court was then at Barcelona, and Columbus took care immediately to acquaint the king and queen of his arrival. They were no leſs delighted than aſtoniſhed with this unexpected event. They gave orders for conducting him into the city with all imaginable pomp They received him clad in their royal robes, and ſeated on a throne under a magnificent canopy. When he approached, they ſtood up; and, raiſing him as he kneeled to kiſs their hands, commanded him to take his ſeat upon a chair prepared for him, and give a circumſtantial account of his voyage. When he had finiſhed his oration, which he delivered with much modeſty and ſimplicity, the king and queen, kneeling down, offered up ſolemn thinks to God for the diſcovery. Every poſſible mark of honour that could be ſuggeſted by gratitude or admiration was conferred on Columbus; the former capitulation was confirmed, his family was ennobled, and a fleet was ordered to be equipped, to enable him to go in queſt of thoſe more opulent countries which he ſtill confidently expected to find.

Notwithſtanding all this reſpect, however, Columbus was no longer regarded than he was ſucceſsful. The coloniſts he carried over with him were to the laſt degree unreaſonable and unmanageable; ſo that he was obliged to uſe ſome ſeverities with them; and complaints were made to the court of Spain againſt him for cruelty. On this, Francis de Bovadilla, a knight of Calatrava, was appointed to inquire into the conduct of Columbus; with orders, in caſe he found the charge of maladminiſtration proved, to ſuperſede him, and aſſume the office of governor of Hiſpaniola. The conſequence of this was, that Columbus was ſent to Spain in chains. From theſe, however, he was freed immediately on his arrival, and had an opportunity granted him of vindicating his innocence. He was, however, deprived of all power; and notwithſtanding his great ſervices, and the ſolemnity of the agreement between him and Ferdinand, Columbus never could obtain the fulfilment of any part of that treaty. At laſt, diſguſted with the ingratitude of a monarch whom he had ſerved with ſuch fidelity and ſucceſs, and exhauſted with fatigues, he ended his life on the 29th of May 1506.

Columbus, *Bartholomew*, brother to Chriſtopher, famous for his marine charts and ſpheres, which he preſented to Henry VII. of England. He died in 1514.

Columbus, *Don Ferdinand*, ſon of Chriſtopher, and writer of his life. He entered into the eccleſiaſtical ſtate; and founded a library, which he bequeathed to the church of Seville, to this day called the *Columbine library*. He died in 1560.

COLUMELLA, Lucius Junius Moderatus, a

* See *Hiſpaniola*.

Roman philoſopher, was a native of Cadiz, and lived under the emperor Claudius, about the year 42. He wrote a book on agriculture entitled *De Re Ruſtica*, and another *De Arboribus*.

COLUMEY, a town of Red Ruſſia in Poland, ſeated on the river Pruth, towards the confines of Moldavia, about 28 miles from Halicz, and 63 ſouth of Leopol. This town has been very ill treated by the Coſſacks, inſomuch that it is now inconſiderable, though there are ſeveral mines of ſalt in its diſtrict. E. Long. 16. 25. N. Lat. 49. 45.

COLUMN, in *Architecture*, a round pillar made to ſupport and adorn a building, and compoſed of a baſe, a ſhaft, and capital. See ARCHITECTURE, N° 33.

COLUMNS, *denominated from their uſe*.—Aſtronomical column is a kind of obſervatory, in form of a very high tower built hollow, and with a ſpiral aſcent to an armillary ſphere placed a-top for obſerving the motions of the heavenly bodies. Such is that of the Doric order erected at the Hotel de Soiſſons at Paris, by Catharine de Medicis, for the obſervations of Orontius Fineus, a celebrated aſtronomer of that time.

Chronological COLUMN, that which bears ſome hiſtorical inſcription digeſted according to the order of time; as by luſtres, olympiads, faſti, epochas, annals, &c. At Athens, there were columns of this kind, whereon was inſcribed the whole hiſtory of Greece digeſted into olympiads.

Funeral COLUMN, that which bears an urn, wherein are ſuppoſed to be encloſed the aſhes of ſome deceaſed hero; and whoſe ſhaft is ſometimes overſpread with tears and flames, which are ſymbols of grief and of immortality.

Gnomonic COLUMN, a cylinder whereon the hour of the day is repreſented by the ſhadow of a ſtile. See DIAL.

Hiſtorical COLUMN, is that whoſe ſhaft is adorned with a baſſo-relievo, running in a ſpiral line its whole length, and containing the hiſtory of ſome great perſonage: ſuch are the Trajan and Antonine columns at Rome.

Hollow COLUMN, that which has a ſpiral ſtaircaſe withinſide for the convenience of aſcending to the top; as the Trajan column, the ſtaircaſe whereof conſiſts of 18 ſteps, and is illuminated by 43 little windows, each of which is divided by tambours of white marble. The monument, or fire-column, at London, has alſo a ſtaircaſe; but it does not reach to the top. Theſe kinds of columns are alſo called *columnæ coclideæ*, or *cochlideæ*.

Indicative COLUMN, that which ſerves to ſhow the tides, &c. along the ſea-coaſts. Of this kind there is one at Grand Cairo of marble, on which the overflowings of the Nile are expreſſed; by this they form a judgment of the ſucceeding ſeaſons; when the water, for inſtance, aſcends to 23 feet, it is a ſign of great fertility in Egypt. See NILOMETER.

Inſtructive COLUMN, that raiſed, according to Joſephus, lib. i. cap. 3. by the ſons of Adam, whereon were engraven the principles of arts and ſciences. Baudelot tells us, that the ſon of Piſiſtratus raiſed another of this kind, of ſtone, containing the rules and precepts of agriculture

Itinerary COLUMN, a column with ſeveral faces, placed in the croſs ways in large roads; ſerving to ſhow the different routes by inſcriptions thereon.

Lactary COLUMN, at Rome, according to Feſtus, was a column erected in the herb-market, now the place *Montanara*, which had a cavity in its pedeſtal, wherein young children abandoned by their parents, out of poverty or inhumanity, were expoſed, to be brought up at the public expence.

Legal COLUMN. Among the Lacedemonians there were columns raiſed in public places, whereon were engraven the fundamental laws of the ſtate.

Limitrophous or *Boundary* COLUMN, that which ſhows the limits of a kingdom or country conquered. Such was that which Pliny ſays Alexander the Great erected at the extremity of the Indies.

Manubiary COLUMN, from the Latin *manubiæ*, "ſpoils of the enemy;" a column adorned with trophies built in imitation of trees, whereon the ſpoils of enemies were anciently hung. See TROPHY.

Memorial COLUMN, that raiſed on occaſion of any remarkable event, as the monument of London, built to perpetuate the memory of the burning of that city in 1666. It is of the Doric order, fluted, hollow, with a winding-ſtaircaſe; and terminated a-top with waving flames. There is alſo another of the kind, in form of an obeliſk, on the banks of the Rhine in the Palatinate, in memory of the famous paſſage of that river by the great Guſtavus Adolphus and his army.

Menian COLUMN, any column which ſupports a balcony or meniana. The orgin of this kind of column, Suetonius and Aſcanius refer to one Menias; who having ſold his houſe to Cato and Flaccus, conſuls, to be converted into a public edifice, reſerved to himſelf the right of raiſing a column withoutſide, to bear a balcony, whence he might ſee the ſhows.

Military COLUMN, among the Romans, a column whereon was engraven a liſt of the forces in the Roman army, ranged by legions, in their proper order; with deſign to preſerve the memory of the number of ſoldiers, and of the order preſerved in any military expedition. They had another kind of military column, which they called *columna bellica*, ſtanding before the temple of Janus; at the foot whereof the conſul declared war by throwing a javelin towards the enemies countries.

Milliary COLUMN, was a column of marble raiſed by order of Auguſtus in the middle of the Roman forum; from whence, as a centre, the diſtances of the ſeveral cities, &c. of the empire were reckoned, by other milliary columns diſpoſed at equal diſtances on all the grand roads. This column was of white marble, the ſame with that which is now ſeen on the balluſtrade of the perron of the capitol at Rome. Its proportion is maſſive, being a ſhort cylinder, the ſymbol of the globe of the earth. It was called *milliarium aureum*, as having been gilt, at leaſt the ball, by order of Auguſtus It was reſtored by the emperors Veſpaſian and Adrian, as appears by the inſcriptions.

Sepulchral COLUMN, anciently was a column erected on a tomb or ſepulchre, with an inſcription on its baſe. Thoſe over the tombs of perſons of diſtinction were very large; thoſe for the common people ſmall: theſe laſt are called *ſtelæ* and *cippi*.

Statuary COLUMN, that which ſupports a ſtatue. Such was that erected by Pope Paul V. on a pedeſtal before the church of St Maria at Rome; to ſupport a ſtatue of the Virgin, which is of gilt braſs. This column was dug up in the temple of Peace; its ſhaft is a ſingle block of white marble 49½ feet high, and five feet eight inches diameter, of the Corinthian order.

The term *ſtatuary column* may likewiſe be applied to Caryatides, Perſians, termini, and other human figures, which do the office of columns; and which Vitruvius calls *telomones* and *atlantes*. See ARCHITECTURE, N° 54.

Triumphal COLUMN, a column erected among the ancients in honour of a hero; the joints of the ſtones, or courſes whereof, were covered with as many crowns as he had made different military expeditions. Each crown had its particular name, as *vallaris*, which was beſet with ſpikes, in memory of having forced a paliſade. *Muralis*, adorned with little turrets, or battlements, for having mounted an aſſault. *Navalis*, of prows and beaks of veſſels; for having overcome at ſea. *Obſidionalis*, or *graminalis*, of graſs; for having raiſed a ſiege. *Ovans*, of myrtle; which expreſſed an ovation, or little triumph; and *triumphalis*, of laurel, for a grand triumph. See CROWN.

COLUMNARIUM, in Roman antiquity, a heavy tribute, demanded for every pillar of a houſe. It was firſt laid on by Julius Cæſar, in order to put a ſtop to the extravagant expences laid out on ſumptuous buildings.

COLUMNEA. See BOTANY *Index*.

COLUMNIFERI, in *Botany*, an order of plants in the *fragmenta methodi naturalis* of Linnæus. See BOTANY *Index*.

COLURES, in *Aſtronomy* and *Geography*, two great circles ſuppoſed to interſect each other at right angles in the poles of the world, and to paſs through the ſolſtitial and equinoctial points of the ecliptic. See GEOGRAPHY.

COLURI, a little iſland in the gulph of Engia, in the Archipelago, formerly called *Salamis*. The principal town is of the ſame name, and ſeated on the ſouth ſide, at the bottom of the harbour, which is one of the fineſt in the world. The famous Grecian hero, Ajax, who makes ſuch a figure in Homer's Iliad, was king of this iſland. It is now, however, but a poor place; its commodities conſiſt of wheat, barley, tar, roſin, pit-coal, ſponges, and pot-aſhes, which they carry to Athens. It is ſeven miles ſouth from Athens, and is ſeparated from the continent by a ſtrait about a mile over.

COLUTEA, BASTARD-SENA. See BOTANY *Index*.

COLYBA, or COLYBUS; a term in the Greek liturgy, ſignifying an offering of corn and boiled pulſe, made in honour of the ſaints, and for the ſake of the dead.

Balſamon, P. Goar, Leo Allatius, and others, have written on the ſubject of *colybæ;* the ſubſtance of what they have ſaid is as follows: The Greeks boil a quantity of wheat, and lay it in little heaps on a plate; adding beaten peas, nuts cut ſmall, and grape-ſtones, which they divide into ſeveral compartments, ſeparated from each other by leaves of parſley. A little heap of wheat, thus ſeaſoned, they call κολυβα. They have a particular formula for the benediction of the *colybæ*, wherein, praying that the children of Babylon may be fed with pulſe, and that they may be in better condition than other people, they deſire God to bleſs thoſe fruits, and thoſe who eat them, becauſe offered to his glory, to the honour of ſuch a ſaint, and in memory of the faithful deceaſed. Balſamon refers the inſtitution of this ceremony to St Athanaſius; but the Greek Synaxary to the time of Julian the apoſtate.

COLYMBUS, a genus of birds belonging to the order of anſeres. See ORNITHOLOGY *Index*.

COM, a town of Aſia in the empire of Perſia, and province of Irac-agemi. It is a large populous place, but has ſuffered greatly by the civil wars. E. Long. 51. 56. N. Lat. 34. 5.

COMA, or COMA-VIGIL, a preternatural propenſity to ſleep, when, nevertheleſs, the patient does not ſleep, or if he does, awakes immediately without any relief. See MEDICINE *Index*.

COMA *Berenices*, Berenice's hair, in *Aſtronomy*, a modern conſtellation of the northern hemiſphere, compoſed of unformed ſtars between the Lion's tail and Boötes. This conſtellation is ſaid to have been formed by Conon, an aſtronomer, in order to conſole the queen of Ptolemy Euergetes for the loſs of a lock of her hair, which was ſtolen out of the temple of Venus, where ſhe had dedicated it on account of a victory obtained by her huſband. The ſtars of this conſtellation, in Tycho's Catalogue, are fourteen; in Hevelius's, twenty-one; and in the Britannic Catalogue, forty-three.

COMA *Somnolentum*, is when the patient continues in a profound ſleep; and, when awakened, immediately relapſes, without being able to keep open his eyes.

COMARUM, MARSH-CINQUEFOIL. See BOTANY *Index*.

COMB, an inſtrument to clean, untangle, and dreſs flax, wool, hair, &c.

Combs for wool are prohibited to be imported into England.

COMB is alſo the creſt, or red fleſhy tuft, growing upon a cock's head.

COMBAT, in a general ſenſe, denotes an engagement, or a difference decided by arms. See BATTLE.

COMBAT, in our ancient law, was a formal trial of ſome doubtful cauſe or quarrel, by the ſwords or baſtons of two champions. This form of proceeding was very frequent, not only in criminal but in civil cauſes; being built on a ſuppoſition that God would never grant the victory but to him who had the beſt right. The laſt trial of this kind in England was between Donald Lord Reay appellant, and David Ramſay, Eſq. defendant, when, after many formalities, the matter was referred to the king's pleaſure. See the article BATTLE.

COMBINATION, properly denotes an aſſemblage of ſeveral things, two by two.

COMBINATION, in *Mathematics*, is the variation or alteration of any number of quantities, letters, or the like, in all the different manners poſſible. See CHANGES.

Aphoriſms. I. In all combinations, if from an arithmetic decreaſing ſeries, whoſe firſt term is the number out of which the combinations are to be formed, and whoſe common difference is 1, there be taken as many terms as there are quantities to be combined, and theſe terms be multiplied into each other; and if from the ſeries 1, 2, 3, 4, &c. there may be taken the ſame number of terms, and they be multiplied into each other, and the firſt product be divided by the ſecond; the quotient will be the number of combinations required. Therefore, if you would know how many ways four quantities can be combined in ſeven, multiply the firſt four terms of the ſeries, 7, 6, 5, 4, &c. together, and divide the product, which will be 840, by the product of the firſt four terms of the ſeries, 1, 2, 3, 4, &c. which is 24, and the quotient 35 will be the combination of 4 in 7. II. In all permutations, if the ſeries 1, 2, 3, 4, &c. be continued to as many terms as there are quautities to be changed, and thoſe terms be multiplied into each other; the product will be the number of permutations ſought. Thus, if you would know how many permutations can be formed with five quantities, multiply the terms 1, 2, 3, 4, 5, together, and the product 120 will be the number of all the permutations.

Problems. I. To find the number of changes that may be rung on 12 bells. It appears by the ſecond aphoriſm, that nothing more is neceſſary here than to multiply the numbers from 1 to 12 continually into each other, in the following manner, and the laſt product will be the number ſought.

1
2
2
3
6
4
24
5
120
6
720
7
5040
8
40320
9
362880
10
3628800
11
39916800
12
479,001,600

II. Suppoſe the letters of the alphabet to be wrote ſo ſmall that no one of them ſhall take up more ſpace than the hundredth part of a ſquare inch: to find how many ſquare yards it would require to write all the permutations of the 24 letters in that ſize. By following the ſame method as in the laſt problem, the number of permutations of the 24 letters will be found to be 62,044,840,173,323,943,936,000. Now the inches in a ſquare yard being 1296, that number multiplied by 100 gives 129,600, which is the number of letters each ſquare yard will contain; therefore if we divide 62,044,840,173,323,943,936,000 by 129600, the quotient, which is 478,741,050,720,092,160, will be the number of yards required, to contain the above-mentioned number of permutations. But as all the 24 letters are contained in every permutation, it will require a ſpace 24 times as large; that is, 11,489,785,217,282,211,840. Now the number of ſquare yards contained on the ſurface of the whole earth is but 617,197,435,008,000, therefore it would require a ſurface 18620 times as large as that of the earth to write all the permutations of the 24 letters in the ſize above mentioned.

III. To find how many different ways the eldeſt hand at piquet may take in his five cards. The eldeſt hand having 12 cards dealt him, there remain 20 cards, any five of which may be in thoſe he takes in; conſequently we are here to find how many ways five cards may be taken out of 20. Therefore, by aphoriſm I. if we multiply 20, 19, 18, 17, 16, into each other, which will make 1860480, and that number be divided by 1, 2, 3, 4, 5, multiplied into each other, which make 120, the quotient, which is 15504, will be the number of ways five cards may be taken out of 20. From hence it follows, that it is 15503 to 1, that the eldeſt hand does not take in any five certain cards.

IV. To find the number of deals a perſon may play at the game of whiſt, without ever holding the ſame cards twice. The number of cards played with at whiſt being 52, and the number dealt to each perſon being 13, it follows, that by taking the ſame method as in the laſt experiment, that is, by multiplying 52 by 51, 50, &c. ſo on to 41, which will make 3,954,242,643,911,239,680,000, and then dividing that ſum by 1, 2, 3, &c. to 13, which will make 6,227,020,800, the quotient, which is 635,013,559,600 will be the number of different ways 13 cards may be taken out of 52, and conſequently the number ſought.

The ARITHMETIC TRIANGLE;

or *Table for Combinations.*

A
1 Rank 1 B
2 2. 1
3 3. 3. 1
4 4. 6. 4. 1
5 5. 10. 10. 5. 1
6 6. 15. 20. 15. 6. 1
7 7. 21. 35. 35. 21. 7. 1
8 8. 28. 56. 70. 56. 28. 8. 1
9 9. 36. 84. 126. 126. 84. 36. 9. 1
10 10. 45. 120. 210. 252. 210. 120. 45. 10. 1
11 11. 55. 165. 330. 462. 462. 330. 165. 55. 11. 1
12 *a* 12. 66. 220. 495. 792. 924. 792. 495. 220. 66. 12. 1 *b*
c

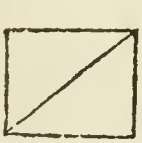
The conſtruction of this table is very ſimple. The line A *a* conſiſts of the firſt 12 numbers. The line A *b* conſiſts everywhere of units; and ſecond term 3, of the line B *c*, is compoſed of the two terms 1 and 2 in the preceding rank: the third term 6, in that line, is formed of the two terms 3 and 3 in the preceding rank: and ſo of the reſt; every term, after the firſt, being compoſed of the two next terms in the preceding rank: and by the ſame method it may be continued to any number of ranks. To find by this table how often any number of things can be combined in another number, under 13, as ſuppoſe 5 cards out of 8: in the eighth rank look for the fifth term, which is 56, and that is the number required.

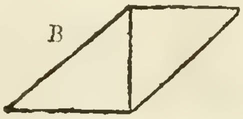
Though we have ſhown in the foregoing problems the manner of finding the combination of all numbers whatever, yet as this table anſwers the ſame purpoſe, for ſmall numbers, by inſpection only, it will be found uſeful on many occaſions; as will appear by the following examples.

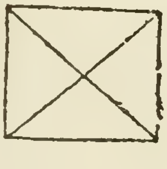
V. To find how many different ſounds may be produced by ſtriking on a harpſichord two or more of the ſeven natural notes at the ſame time. 1. The combinations of two in ſeven, by the foregoing triangle are, - - - - 21
2. The combinations of 3 in 7, are - 35
3. The combinations of 4 in 7, are - 35
4. The combinations of 5, are - 21
5. The combinations of 6, are - 7
6. The ſeven notes all together once. - 1

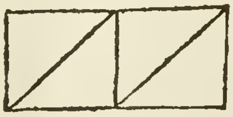
Therefore the number of all the ſounds will be 120

VI. Take four ſquare pieces of paſteboard, of the ſame dimenſion, and divide them diagonally, that is, by drawing a line from two oppoſite angles, as in the figures, into 8 triangles; paint 7 of theſe triangles with the primitive colours, red, orange, yellow, green, blue, indigo, violet, and let the eighth be white. To find how many chequers or regular four-ſided figures, different either in form or colour, may be made out of thoſe eight triangles. Firſt, by combining two of theſe triangles, there may be formed either the triangular ſquare A, or the inclined ſquare B called a *rhomb*. Secondly, by combining four of the triangles, the large ſquare C may be formed; or the long ſquare D, called a *parallelogram*.

A


B


C


D


Now the firſt two ſquares, conſiſting of two parts out of 8, they may each of them, by the eighth rank of the triangle, be taken 28 different ways, which makes 56. And the laſt two ſquares, conſiſting of four parts, may each be taken by the ſame rank of the triangle 70 times, which makes - 140
To which add the foregoing number - 56

And the number of the different ſquares that may be formed of the 8 triangles will be } 196

VII. A man has 12 different ſorts of flowers, and a large number of each ſort. He is deſirous of ſetting them in beds or flouriſhes in his parterre: Six flowers in ſome, 7 in others, and 8 in others; ſo as to have the greateſt variety poſſible; the flowers in no two beds to be the ſame. To find how many beds he muſt have. 1. The combinations of 6 in 12 by the laſt rank of the triangle, are - 924
2. The combinations of 7 in 12, are - 792
3. The combinations of 8 in 12, are - 495

Therefore the number of beds muſt be - 2211

VIII. To find the number of chances that may be thrown on two dice. As each die has ſix faces, and as each face of one die may be combined with all the faces of the other, it follows, that 6 multiplied by 6, that is, 36, will be the number of all the chances; as is alſo evident from the following table:

Points.							Numb. of chances.	Numb. of points.
2	1.1						1	2
3	2.1	1.2					2	6
4	2.2	3.1	1.3				3	12
5	4.1	1.4	3.2	2.3			4	20
6	3.3	5.1	1.5	4.2	2.4		5	30
7	6.1	1.6	5.2	2.5	4.3	3.4	6	42
8	4.4	6.2	2.6	5.3	3.5		5	40
9	6.3	3.6	5.4	4.5			4	36
10	5.5	6.4	4.6				3	30
11	6.5	5.6					2	22
12	6.6						1	12
							36	252

It appears by this table, 1. That the number of chances for each point continually increaſes to the point of ſeven, and then continually decreaſes till 12: therefore if two points are propoſed to be thrown, the equality, or the advantage of one over the other, is clearly viſible (A). 2. The whole number of chances on the dice being 252, if that number be divided by 36, the number of different throws on the dice, the quotient is 7: it follows therefore, that at every throw there is an equal chance of bringing ſeven points. 3. As there are 36 chances on the dice, and only 6 of them doublets, it is 5 to 1, at any one throw, againſt throwing a doublet.

By

(A) It is eaſy from hence to determine whether a bett propoſed at hazard, or any other game with the dice, be advantageous or not; if the dice be true (which, by the way, is rarely the caſe for any long time together, as it is ſo eaſy for thoſe that are poſſeſſed of a dexterity of hand to change the true dice for falſe).

By the ſame method the number of chances upon any number of dice may be found: for if 36 be multiplied by 6, that product, which is 216, will be the chances on 3 dice; and if that number be multiplied by 6, the product will be the chances on 4 dice, &c.

Combinations of the Cards. The following experiments, founded on the doctrine of combinations, may poſſibly amuſe a number of our readers. The tables given are the baſis of many experiments, as well on numbers, letters, and other ſubjects, as on the cards; but the effect produced by them with the laſt is the moſt ſurpriſing, as that which ſhould ſeem to prevent any colluſion, that is, the ſhuffling of the cards, is on the contrary the cauſe from whence it proceeds.

It is a matter of indifference what numbers are made uſe of in forming theſe tables. We ſhall here confine ourſelves to ſuch as are applicable to the ſubſequent experiments. Any one may conſtruct them in ſuch manner as is agreeable to the purpoſes he intends they ſhall anſwer.

To make them, for example, correſpond to the nine digits and a cipher, there muſt be ten cards, and at the top of nine of them muſt be written one of the digits, and on the tenth a cipher. Theſe cards muſt be placed upon each other in the regular order, the number 1 being on the firſt, and the cipher at bottom. You then take the cards in your left hand, as is commonly done in ſhuffling, and taking off the two top cards 1 and 2, you place the two following, 3 and 4, upon them; and under thoſe four cards the three following 5, 6, and 7: at the top you put the cards 8 and 9, and at the bottom the card marked 0; conſtantly placing in ſucceſſion 2 at top and 3 at bottom: And they will then be in the following order:

8.9..3.4..1.2...5.6.7..0

If you ſhuffle them a ſecond time, in the ſame manner, they will then ſtand in this order:

6.7..3.4..8.9..1.2.5.7..0

Thus, at every new ſhuffle they will have a different order, as is expreſſed in the following lines:

1 ſhuffle	8.9.3.4.1.2.5.6.7.0
2	6.7.3.4.8.9.1.2.5.0
3	2.5.3.4.6.7.8.9.1.0
4	9.1.3.4.2.5.6.7.8.0
5	7.8.3.4.9.1.2.5.6.0
6	5.6.3.4.7.8.9.1.2.0
7	1.2.3.4.5.6.7.8.9.0

It is a remarkable property of this number, that the cards return to the order in which they were firſt placed, after a number of ſhuffles, which added to the number of columns that never change the order, is equal to the number of cards. Thus the number of ſhuffles is 7, and the number of columns in which the cards marked 3, 4, &c. never change their places is 3, which are equal to 10, the number of the cards. This property is not common to all numbers; the cards ſometimes returning to the firſt order in a leſs number, and ſometimes in a greater number of ſhuffles than that of the cards.

Tables of Combinations,

Conſtructed on the foregoing principles.

I. *For ten numbers.*

Order before dealing.	After 1ſt deal.	After the 2d.	After the 3d.
1	8	6	2
2	9	7	5
3	3	3	3
4	4	4	4
5	1	8	6
6	2	9	7
7	5	1	8
8	6	2	9
9	7	5	1
0	0	0	0

Theſe tables, and the following examples at piquet, except the 36th, appear to have been compoſed by M. Guyot.

II. *For twenty-four Numbers.*

Order before dealing.	After 1ſt deal.	After the 2d.	After the 3d.
1	23	21	17
2	24	22	20
3	18	12	2
4	19	15	7
5	13	5	13
6	14	6	14
7	8	9	3
8	9	3	18
9	3	18	12
10	4	19	15
11	1	23	21
12	2	24	22
13	5	13	5
14	6	14	6
15	7	8	9
16	10	4	19
17	11	1	23
18	12	2	24
19	15	7	8
20	16	10	4
21	17	11	1
22	20	16	10
23	21	17	11
24	22	20	16

III. *For Twenty-ſeven Numbers.*

Order before dealing.	After 1ſt deal.	After the 2d.	After the 3d.
1	23	21	17
2	24	22	20
3	18	12	2
4	19	15	7
5	13	5	13
6	14	6	14
7	8	9	3
8	9	3	18
9	3	18	12
10	4	19	16
11	1	13	21
12	2	24	22
13	5	13	5

14

Order before dealing.	After 1ſt deal.	After the 2d.	After the 3d.
14	6	14	6
15	7	8	9
16	10	4	19
17	11	1	23
18	12	2	24
19	15	7	8
20	16	10	4
21	17	11	1
22	20	16	10
23	21	17	11
24	22	20	16
25	25	25	25
26	26	26	26
27	27	27	27

IV. *For Thirty-two Numbers.*

Order before dealing.	After 1ſt deal.	After the 2d.	After the 3d.
1	28	26	22
2	29	27	25
3	23	17	7
4	24	20	12
5	18	10	9
6	19	11	3
7	13	1	28
8	14	2	29
9	8	14	2
10	9	8	14
11	3	23	17
12	4	24	20
13	1	28	26
14	2	29	27
15	5	18	10
16	6	19	11
17	7	13	1
18	10	9	8
19	11	3	23
20	12	4	24
21	15	5	18
22	16	6	19
23	17	7	13
24	20	12	4
25	21	15	5
26	22	16	6
27	25	21	15
28	26	22	16
29	27	25	21
30	30	30	30
31	31	31	31
32	32	32	32

I. "Several letters that contain no meaning, being "written upon cards, to make them, after they have "been twice ſhuffled, give an anſwer to a queſtion "that ſhall be propoſed; as, for example, *What 'is love?*" Let 24 letters be written on as many cards which, after they have been twice ſhuffled, ſhall give the following anſwer:

A dream of joy that ſoon is o'er.

Firſt, write one of the letters in that line on each of the cards (B). Then write the anſwer on a paper, and aſſign one of the 24 firſt numbers to each card, in the following order:

A D R E A M O F J O Y T H A T S O O N
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19

I S O ' E R.
20 21 22 23 24

Next, write on another paper a line of numbers from 1 to 24, and looking in the table for 24 combinations, you will ſee that the firſt number after the ſecond ſhuffle is 21; therefore the card that has the firſt letter of the anſwer, which is A, muſt be placed againſt that number, in the line of numbers you have juſt made (C.) In like manner the number 22 being the ſecond of the ſame column, indicates that the card which anſwers to the ſecond letter D of the anſwer, muſt be placed againſt that number; and ſo of the reſt. The cards will then ſtand in the following order:

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 18 19
O O F S A M N T O I S R H A E O 'E J

20 21 22 23 24
R A D Y T

From whence it follows, that after theſe cards have been twice ſhuffled, they muſt infallibly ſtand in the order of the letters in the anſwer.

Obſerve. 1. You ſhould have ſeveral queſtons, with their anſwers, conſiſting of 24 letters, written on cards; theſe cards ſhould be put in caſes, and numbered, that you may know to which queſtion each anſwer belongs. You then preſent the queſtions; and when any one of them is choſen, you pull out the caſe that contains the anſwer, and ſhowing that the letters written on them make no ſenſe, you then ſhuffle them, and the anſwer becomes obvious.

2. To make this experiment the more extraordinary, you may have three cards, on each of which an anſwer is written; one of which cards muſt be a little wider, and another a little longer, than the others. You give theſe three cards to any one, and when he has privately choſen one of them, he gives you the other two, which you put in your pocket without looking at them, having diſcovered by feeling which he has choſen. You then pull out the caſe that contains the cards that anſwer to his queſtion, and perform as before.

3. You may alſo contrive to have a long card at the bottom after the ſecond ſhuffle. The cards may be then cut ſeveral times, till you perceive by the touch that the long card is at bottom, and then give the an-

---

(B) Theſe letters ſhould be written in capitals on one of the corners of each card, that the words may be eaſily legible when the cards are ſpread open.

(C) For the ſame reaſon, if you would have the anſwer after one ſhuffle, the cards muſt be placed according to the firſt column of the table; or if after three ſhuffles, according to the third column.

Combination.

ſwer ; for the repeated cuttings, however often, will make no alteration in the order of the cards.

The ſecond of theſe obſervations is applicable to ſome of the ſubſequent experiments, and the third may be practiſed in almoſt all experiments with the cards. You ſhould take care to put up the cards as ſoon as the anſwer has been ſhewn ; ſo that if any one ſhould deſire the experiment to be repeated, you may offer another queſtion, and pull out thoſe cards that contain the anſwer.

Though this experiment cannot fail of exciting at all times pleaſure and ſurpriſe, yet it muſt be owned that a great part of the applauſe it receives ariſes from the addreſs with which it is performed.

II. “ The 24 letters of the alphabet being written upon ſo many cards, to ſhuffle them, and pronounce the letters ſhall then be in their natural order ; but that not ſucceeding, to ſhuffle them a ſecond time, and then ſhow them in proper order.” Write the 24 letters on the cards in the following order :

1 2 3 4 5 6 7 8 9 10 11 12
R S H Q E F T P G U X C

13 14 15 16 17 18 19 20 21 22 23 24
N O D Y Z I K & A B L M

The cards being diſpoſed in this manner, ſhow them upon the table, that it may appear they are promiſcuouſly marked. Then ſhuffle and lay them again on the table, pronouncing that they will be then in alphabetical order. Appear to be ſurpriſed that you have failed ; take them up again, and give them a ſecond ſhuffle, and then counting them down on the table they will all be in their natural order.

III. “ Several letters being written promiſcuouſly upon 32 cards, after they have been once ſhuffled, to find in a part of them a queſtion ; and then ſhuffling the remainder a ſecond time, to ſhow the anſwer. Suppoſe the queſtion to be, *What is each Briton's boaſt ?* and the anſwer, *His liberty ;* which taken together contain 32 letters.”

After you have written thoſe letters on 32 cards, write on a paper the words, *his liberty*, and annex to the letters the firſt ten numbers thus :

H I S L I B E R T Y.
1 2 3 4 5 6 7 8 9 10

Then have recourſe to the table of combinations for ten numbers, and apply the reſpective numbers to them in the ſame manner as in experiment I. taking the firſt column, as theſe are to be ſhuffled only once according to that order.

1 2 3 4 5 6 7 8 9 10
I B S L E R T H I Y

This is the order in which theſe cards muſt ſtand after the whole number 32 has been once ſhuffled, ſo that after a ſecond ſhuffle they may ſtand in their proper order. Next diſpoſe the whole number of letters according to the firſt column for 32 letters ; the laſt ten are to be here placed in the order above ; as follows :

W H A T I S E A C H B R I T O N ' S
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

B O A S T ?
18 19 20 21 22

I B S L E R T H I Y
23 24 25 26 27 28 29 30 31 32

Therefore, by the firſt column of the table, they will next ſtand thus :

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
I T B R O N S C H B O A E A S T *long card.*

17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
I I S B S L I B E R T W H H I Y

You muſt obſerve, that the card here placed the 16th in order, being the laſt of the queſtion, is a long card ; that you may cut them, or have them cut, after the firſt ſhuffle, at that part, and by that means ſeparate them from the other ten cards that contain the anſwer.

Your cards being thus diſpoſed, you ſhow that they make no meaning ; then ſhuffle them once, and cutting them at the long card, you give the firſt part to any one, who reads the queſtion, but can find no anſwer in the others, which you open before him ; you then ſhuffle them a ſecond time, and ſhow the anſwer as above.

IV. “ To write 32 letters on ſo many cards, then ſhuffle and deal them by twos to two perſons, in ſuch manner, that the cards of one ſhall contain a queſtion, and thoſe of the other an anſwer. Suppoſe the queſtion to be *Is nothing certain ?* and the anſwer, *Yes, diſappointment.*”

Over the letters of this queſtion and anſwer, write the following numbers, which correſpond to the order in which the cards are to be dealt by two and two.

I S N O T H I N G C E R T A I N ?
31 32 27 28 23 24 19 20 15 16 11 12 7 8 3 4

Y E S, D I S A P O I N T M E N T.
29 30 25 26 21 22 17 18 13 14 9 10 5 6 1 2

Then have recourſe to the firſt column of the table for 32 numbers, and diſpoſe theſe 32 cards in the following order, by that column.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
O I E R G C A N T P I N T A I S

17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
T M E H S D I N N O Y N T E I S

The cards being thus diſpoſed, ſhuffle them once, and deal them two and two : when one of the parties will neceſſarily have the queſtion, and the other the anſwer.

Inſtead of letters you may write words upon the 32 cards, 16 of which may contain a queſtion, and the remainder the anſwer ; or what other matter you pleaſe. If there be found difficulty in accommodating the words to the number of cards, there may be two or more letters or ſyllables written upon one card.

V. “ The five beatitudes.” The five bleſſings we will ſuppoſe to be, 1. Science. 2. Courage, 3. Health 4. Riches, and 5. Virtue. Theſe are to be found upon cards that you deal, one by one, to five perſons. Firſt, write the letters of theſe words ſucceſſively, in the order they ſtand, and then add the numbers here annexed to them.

S	C	I	E	N	C	E	C	O	U	R	A	G	E
31	26	21	16	11	6	1	32	27	22	17	12	7	2

H	E	A	L	T	H	R	I	C	H	E	S
28	23	18	13	8	3	29	24	19	14	9	4

V	I	R	T	U	E
30	25	20	15	10	5

Then range them in order agreeable to the firſt column of the table for 32 numbers, as in the experiment. Thus,

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L	H	N	A	T	E	R	E	U	A	C	R	G	T	I	U

17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
E	E	C	I	I	C	H	S	O	H	R	E	E	V	S	C

Next take a pack of cards and write on the four firſt the word Science; on the four next, the word Courage; and ſo of the reſt.

Matters being thus prepared, you ſhow that the cards on which the letters are written convey no meaning. Then take the pack on which the words are written, and ſpreading open the firſt four cards, with their backs upward, you deſire the firſt perſon to chooſe one. Then cloſe thoſe cards, and ſpread the next four to the ſecond perſon; and ſo to all the five; telling them to hold up their cards leſt you ſhould have a confederate in the room.

You then ſhuffle the cards, and deal them one by one, in the common order, beginning with the perſon who choſe the firſt card, and each one will find in his hand the ſame word as is written on his card. You will obſerve, that after the ſixth round of dealing, there will be two cards left, which you give to the firſt and ſecond perſons, as their words contain a letter more than the others.

VI. "The cards of the game of piquet being mixed together, after ſhuffling them, to bring, by cutting them, all the cards of each ſuit together." The order in which the cards muſt be placed to produce the effect deſired being eſtabliſhed on the ſame principle as that explained in experiment II. except that the ſhuffling is here to be repeated three times, we think it will be ſufficient to give the order in which they are to be placed before the firſt ſhuffle.

Order of the Cards.

1	Ace	clubs
2	Knave	
3	Eight	diamonds
4	Seven	
	wide card	
5	Ten clubs	
6	Eight	ſpades
7	Seven	
	wide card	
8	Ten	diamonds
9	Nine	
10	Queen	
11	Knave	
12	Queen clubs	
13	Eight	hearts
14	Seven	
	wide card	
15	Ten	ſpades
16	Nine	
17	King clubs	
18	Ten	hearts
19	Nine	
20	Seven clubs	
21	Ace diamonds	
22	Knave ſpades	
23	Queen hearts	
24	Knave hearts	
25	Ace ſpades	
26	King diamonds	
27	Nine clubs	
28	Ace	hearts
29	King	
30	Eight clubs	
31	King	ſpades
32	Queen	

You then ſhuffle the cards, and cutting at the wide card, which will be the ſeven of hearts, you lay the eight cards that are cut, which will be the ſuit of hearts, down on the table. Then ſhuffling the remaining cards a ſecond time, you cut at the ſecond wide card, which will be the ſeven of ſpades, and lay, in like manner, the eight ſpades down on the table. You ſhuffle the cards a third time, and offering them to any one to cut, he will naturally cut them at the wide card (D), which is the ſeven of diamonds, and conſequently divide the remaining cards into two equal parts, one of which will be diamonds and the other clubs,

VII. "The cards at piquet being all mixed together, to divide the pack into two unequal parts, and name the number of points contained in each part." You are firſt to agree that each king, queen, and knave, ſhall count, as uſual, 10, the ace 1, and the other cards according to the number of the points. Then diſpoſe the cards, by the table for 32 numbers, in the following order, and obſerve that the laſt card of the firſt diviſion muſt be a wide card.

Order of the Cards before ſhuffling.

1	Seven hearts	
2	Nine clubs	
3	Eight hearts	
4	Eight	ſpades
5	Knave	
6	Ten	
7	Queen	clubs
8	Ace	
9	Ace hearts	
	wide card	
10	Nine hearts	
11	Queen ſpades	
12	Knave clubs	
13	Ten diamonds	
14	Ten	hearts
15	King	
16	Queen	
17	Nine diamonds	
18	Ace ſpades	
19	Ten clubs	
20	Knave	diamonds
21	Eight	
22	King	
23	Seven ſpades	
24	Seven	diamonds
25	Queen	
26	Knave hearts	
27	King clubs	
28	Nine	ſpades
29	King	
30	Ace diamonds	
31	Seven	clubs
32	Eight	

You then ſhuffle them carefully, according to the method before deſcribed, and they will ſtand in the following order.

(D) You muſt take particular notice whether they be cut at the wide card, and if they are not, you muſt have them cut, or cut them again yourſelf.

Cards.		Numbers.	Cards.		Numbers.
			brought up		34
1 Nine	ſpades	9	6 Ten clubs		10
2 King		10	7 Ten diamonds		10
3 Seven		7	8 Ten hearts		10
4 Seven diamonds		7	9 Ace clubs		1
5 Ace ſpades		1	10 Ace hearts (wide card)		1
carried up		34	total		66

			brought up		101
11 Eight hearts		8	22 Queen hearts		10
12 Eight ſpades		8	23 Nine	diamonds	9
13 Seven hearts		7	24 Knave		10
14 Nine clubs		9	25 Eight		8
15 Knave	ſpades	10	26 King		10
16 Ten		10	27 Queen		10
17 Queen clubs		10	28 Knave hearts		10
18 Nine hearts		9	29 King clubs		10
19 Queen ſpades		10	30 Ace diamonds		1
20 Knave clubs		10	31 Seven	clubs	7
21 King hearts		10	32 Eight		8
carried up		101	total		194

When the cards are by ſhuffling diſpoſed in this order, you cut them at the wide card, and pronounce that the cards you have cut off contain 66 points, and conſequently the remaining part 194.

VIII "The Inconceivable Repique (E)." When you would perform this experiment with the cards uſed in the laſt, you muſt obſerve not to diſorder the firſt 10 cards in laying them down on the table. Putting theſe cards together, in their proper order therefore, you ſhuffle them a ſecond time in the ſame manner, and offer them to any one to cut, obſerving carefully if he cut them at the wide card, which will be the ace of hearts, and will then be at top; if not, you muſt make him, under ſome pretence or other, cut them till it is; and the cards will then be ranged in ſuch order that you will repique the perſon againſt whom you play, though you let him chooſe (even after he has cut) in what ſuit you ſhall make the repique.

Order of the cards after they have been ſhuffled and cut.

1 Eight hearts	
2 Eight	ſpades
3 Knave	
4 Ten	
5 Queen	clubs
6 Knave	
7 King	hearts
8 Queen	
9 Eight	diamonds
10 King	
11 Queen	
12 Ace	
13 Seven	clubs
14 Eight	
15 Knave hearts	
16 King clubs	
17 Nine	diamonds
18 Knave	
19 Nine hearts	
20 Queen ſpades	
21 Seven hearts	
22 Nine clubs	
23 Ten hearts	
24 Ace clubs	
25 Seven ſpades	
26 Seven diamonds	
27 Nine ſpades	
28 King	ſpades
29 Ace	
30 Ten clubs	
31 Ten diamonds	
32 Ace hearts wide card.	

The cards being thus diſpoſed, you aſk your adverſary in what ſuit you ſhall repique him? If he ſay in clubs or diamonds, you muſt deal the cards by threes, and the hands will be as follows:

Elder.	Younger.
Hearts, king	Clubs, ace
——— queen	——— king
——— knave	——— queen
——— nine	——— knave
——— eight	——— nine
——— ſeven	Diamonds, ace
Spades, queen	——— king
——— knave	——— queen
——— eight	——— knave
Diamonds, eight	——— nine
Clubs, eight	Spades, ten
——— ſeven	Hearts, ten
Rentrée, or take in of the elder.	Rentrée of the younger.
Seven ſpades	Ten clubs
Seven diamonds	Ten diamonds
Nine ſpades	Ace hearts
King	
Ace	

If he againſt whom you play, who is ſuppoſed to be elder hand, has named clubs for the repique, and has taken in five cards, you muſt then lay out the queen, knave, and nine of diamonds, and you will have, with the three cards you take in, a ſixiem major in clubs, and quatorze tens. If he leave one or two cards, you muſt diſcard all the diamonds.

If he require to be repiqued in diamonds, then diſcard the queen, knave, and nine of clubs: or all the clubs, if he leave two cards; and will then have a hand of the ſame ſtrength as before.

Note. If the adverſary ſhould diſcard five of his hearts, you will not repique him, as he will then have a ſeptiem in ſpades: or if he only take one card: but neither of theſe any one can do, who has the leaſt knowledge of the game. If the perſon againſt whom you play would be repiqued in hearts or ſpades, you muſt deal the cards by twos, and the game will ſtand thus:

Elder hand.		Younger hand.	
King	diamonds	Ace	clubs
Knave		King	
Nine		Ace	diamonds
Eight		Queen	

Queen

(E) This manœuvre of piquet was invented by the counteſs of L—— (a French lady), and communicated by her to M. Guyot.

Elder hand.		Younger hand.	
Queen	clubs	Queen	ſpades
Knave		Knave	
Nine		Ten	
Eight		King	hearts
Seven		Queen	
Eight	hearts	Knave	
Seven		Ten	
Eight ſpades		Nine	
Rentrée.		Rentrée.	
Seven ſpades		Ten clubs	
Seven diamonds		Ten diamonds	
Nine	ſpades	Ace hearts	
King			
Ace			

If he require to be repiqued in hearts, you keep the quint to a king in hearts, and the ten of ſpades, and lay out which of the reſt you pleaſe: then, even if he ſhould leave two cards, you will have a ſixiem major in hearts, and quatorze tens, which will make a repique.

But if he demand to be repiqued in ſpades; at the end of the deal you muſt dexterouſly paſs the three cards that are at the bottom of the ſtock (that is, the ten of clubs, ten of diamonds, and ace of hearts) to the top (f), and by that means you reſerve the nine, king, and ace of ſpades for yourſelf; ſo that by keeping the quint in hearts, though you ſhould be obliged to lay out four cards, you will have a ſixiem to a king in ſpades, with which and the quint in hearts you muſt make a repique.

Obſerve here likewiſe, that if the adverſary lay out only three cards, you will not make the repique; but that he will never do, unleſs he be quite ignorant of the game, or has ſome knowledge of your intention.

This laſt ſtroke of piquet has gained great applauſe, when thoſe that have publicly performed it have known how to conduct it dexterouſly. Many perſons who underſtand the nature of combining the cards, have gone as far as the paſſing the three cards from the bottom of the ſtock, and have then been forced to confeſs their ignorance of the manner in which it was performed.

IX. "The Metamorphoſed Cards." Provide 32 cards that are differently coloured, on which ſeveral different words are written, and different objects painted. Theſe cards are to be dealt two and two to four perſons, and at three different times, ſhuffling them each time. After the firſt deal, every one's cards are to be of the ſame colour; after the ſecond deal they are all to have objects that are ſimilar: and after the third, words that convey a ſentiment.

Diſpoſe of the cards in the following order.

Cards.	Colours.	Objects.	Words.
1	Yellow	Bird	I find
2	Yellow	Bird	In you
3	Green	Flower	Charming
4	Green	Flower	Flowers
5	White	Bird	To hear
6	White	Orange	Beauty
7	Red	Butterfly	My
8	Red	Flower	Notes
9	Red	Flower	In
10	Red	Butterfly	Shepherdeſs
11	Green	Butterfly	Lover
12	Green	Butterfly	Your
13	White	Flower	Of
14	White	Flower	An inconſtant
15	Yellow	Orange	Image
16	Yellow	Flower	Enchanting
17	White	Orange	Adorn
18	Yellow	Butterfly	My
19	Yellow	Butterfly	Phyllis
20	White	Bird	Birds
21	Red	Orange	Sing
22	Red	Orange	Dear
23	Green	Orange	And ſweetneſs
24	Green	Orange	The
25	Green	Bird	Of
26	Green	Bird	Preſent
27	Yellow	Flower	As
28	Red	Bird	Changes
29	Red	Bird	Boſom
30	Yellow	Orange	Me
31	White	Butterfly	Your
32	White	Butterfly	I long

The cards thus coloured, figured, and tranſcribed, are to be put in a caſe, in the order they here ſtand.

When you would perform this experiment, you take the cards out of the caſe, and ſhow, without changing the order in which they were put, that the colours, objects, and words, are all placed promiſcuouſly. You then ſhuffle them in the ſame manner as before, and deal them, two and two, to four perſons, obſerving that they do not take up their cards till all are dealt, nor mix them together: and the eight cards dealt to each perſon will be found all of one colour. You then take each perſon's cards, and put thoſe of the ſecond perſon under thoſe of the firſt, and thoſe of the fourth perſon under thoſe of the third. After which you ſhuffle them a ſecond time; and having dealt them in the ſame manner, on the firſt perſon's cards will be painted all the birds; on the ſecond perſon's cards, all the butterflies; on thoſe of the third, the oranges; and on thoſe of the fourth, the flowers. You take the cards a ſecond time, and obſerving the ſame precautions, ſhuffle and deal them as before; and then the firſt perſon, who had the laſt time the birds in his hand, will have the words that compoſe this ſentence:

Sing, dear birds; I long to hear your enchanting notes.

The ſecond perſon, who the laſt deal had the butterflies, will now have theſe words:

Of an inconſtant lover your changes preſent me the image.

The third, who had the oranges, will have this ſentence:

(f) The manner of doing this is explained in the article Legerdemain.

As in my Phyllis, I find in you beauty and ſweetneſs.

The fourth, who had the flowers, will have theſe words:

Charming flowers, adorn the boſom of my ſhepherdeſs.

It ſeems quite unneceſſary to give any further detail, as they who underſtand the foregoing experiments will eaſily perform this.

Among the different purpoſes to which the doctrine of combinations may be applied, thoſe of writing in cipher, and deciphering, hold a principal place. See the article CIPHER.

COMBINATION, in *Chemiſtry*, ſignifies the union of two bodies of different natures, from which a new compound body reſults. For example, when an acid is united with an alkali, we ſay that a combination betwixt theſe two ſaline ſubſtances takes place; becauſe from this union a neutral ſalt reſults, which is compoſed of an acid and an alkali.

COMBUST, in *Aſtronomy*. When a planet is in conjunction with the ſun, or not diſtant from it above half its diſk; it is ſaid to be combuſt, or in combuſtion.

According to Argol, a planet is combuſt, or in combuſtion, when not above eight degrees and thirty minutes diſtant from the ſun, either before or after him.

COMBUSTIO PECUNIÆ, the ancient way of trying mixed and corrupt money, by melting it down, upon payments into the exchequer. In the time of King Henry II. a conſtitution was made, called the trial by *combuſtion*; the practice of which differed little or nothing from the preſent method of aſſaying ſilver. But whether this examination of money by combuſtion was to reduce an equation to money only to ſterling, *viz.* a due proportion of alloy with copper, or to reduce it to pure fine ſilver, does not appear. On making the conſtitution of trial it was conſidered, that though the money did anſwer *numero et pondere*, it might be deficient in value; becauſe mixed with copper or braſs, &c.

COMBUSTION, a term denoting the operation of fire upon any inflammable ſubſtance, by which it ſmokes, flames, and is reduced to aſhes.

There is not a phenomenon in nature by which the attention of philoſophers has been more engaged, nor which has puzzled them more to account for, than this very common operation. To explain it, theories have been invented, the moſt oppoſite and contradictory to one another that can be imagined; and, till very lately, the ſtate of ſcience did not afford data ſufficient to explain it in a rational manner. See CHEMISTRY *Index*.

COMEDY, a ſort of dramatic poetry, which gives a view of common and private life, recommends virtue, and corrects the vices and follies of mankind by means of ridicule. See the article POETRY.

This laſt kind alone was received among the Romans, who nevertheleſs made a new ſubdiviſion of it into ancient, middle, and new, according to the various periods of the commonwealth. Among the ancient comedies were reckoned thoſe of Livius Andronicus; among the middle thoſe of Pacuvius; and among the new ones, thoſe of Terence. They likewiſe diſtinguiſhed comedy according to the quality of the perſons repreſented, and the dreſs they wore, into togatæ, prætextatæ, trabeatæ, and tabernariæ, which laſt agrees pretty nearly with our farces. Among us, comedy is diſtinguiſhed from farce, as the former repreſents nature as ſhe is; the other diſtorts and overcharges her. They both paint from the life, but with different views: the one to make nature known, the other to make her ridiculous.

COMENIUS, JOHN AMOS, a grammarian and Proteſtant divine, born in Moravia in 1592. He was eminent for his deſign to introduce a new method of teaching languages; for which purpoſe he publiſhed ſome eſſays in 1616, and had prepared ſome others, when the Spaniards pillaged his library, after having taken the city of Fulnec, where he was miniſter and maſter of the ſchool. Comenius fled to Leſna, a city of Poland, and taught Latin there. The book he publiſhed in 1631, under the title of *Janua Linguarum reſerata*, gained him a prodigious reputation, inſomuch that he was offered a commiſſion for regulating all the ſchools in Poland. The Parliament of England deſired his aſſiſtance to regulate the ſchools in that kingdom. He arrived at London in 1641; and would have been received by a committee to hear his plan, had not the parliament been taken up with other matters. He therefore went to Sweden, being invited by a generous patron, who ſettled a ſtipend upon him that delivered him from the fatigues of teaching; and now he employed himſelf wholly in diſcovering general methods for thoſe who inſtructed youth. In 1657 he publiſhed the different parts of his new method of teaching. He was not only taken up with the reformation of ſchools; but he alſo filled his brain with prophecies, the fall of Antichriſt, Millennium, &c. At laſt Comenius took it into his head to addreſs Louis XIV. of France, and to ſend him a copy of the prophecies of Drabicius; inſinuating, that it was to this monarch God promiſed the empire of the world. He became ſenſible at laſt of the vanity of his labours, and died in 1671.

COMET, an opaque, ſpherical, and ſolid body like a planet, performing revolutions about the ſun in elliptical orbits, which have the ſun in one of their foci.

There is a popular diviſion of comets into *tailed*, *bearded*, and *hairy* comets; though this diviſion rather relates to the different circumſtances of the ſame comet, than to the phenomena of ſeveral. Thus, when the light is weſtward of the ſun, and ſets after it, the comet is ſaid to be *tailed*, becauſe the train follows it in the manner of a tail: when the comet is eaſtward of the ſun, and moves from it, the comet is ſaid to be *bearded*, becauſe the light marches before it in the manner of a beard. Laſtly, when the comet and the ſun are diametrically oppoſite (the earth between them), the train is hid behind the body of the comet, except a little that appears round it in form of a border of *hair*: and from this laſt appearance of the word comet is derived; as κομητης, *cometa*, comes from κομη, *coma*, hair. But there have been comets whoſe diſk was as clear, as round, and as well defined, as that of Jupiter, without either tail, beard, or coma. See ASTRONOMY *Index*.

COMETARIUM, a curious machine, exhibiting an idea of the revolution of a comet about the ſun. See ASTRONOMY *Index*.

COMETEAN, a town of Bohemia in the circle of Saltz, with a handſome town-houſe. It was taken by ſtorm in 1421, and all the inhabitants, men, women, and children, put to the ſword. It is ſeated in a fertile plain, in E. Long. 13. 35. N. Lat. 50. 30.

COMETES. See BOTANY *Index*.

COMFREY. See SYMPHYTUM, BOTANY *Index*.

COMINES, PHILIP DE, an excellent hiſtorian, born of a noble family in Flanders in 1446. He lived in a kind of intimacy with Charles the Bold, duke of Burgundy, for about eight years; but being ſeduced to the court of France by Louis XI. he was highly promoted by him, and executed ſeveral ſucceſsful negociations. After this king's death he experienced many troubles on account of being a foreigner, by the envy of other courtiers, and lay long in priſon before he was diſcharged: he died in 1509. Comines was a man of more natural abilities than learning; he ſpoke ſeveral living, but knew nothing of the dead languages; he has left behind him ſome memoirs of his own times, that are admired by all true judges of hiſtory. Catherine de Medicis uſed to ſay, that Comines made as many heretics in politics as Luther had done in religion.

COMINES, a town of French Flanders on the lines which the French have made to defend their country againſt the Auſtrian Netherlands. It is ſituated on the river Lis, in E. Long. 3. 1. N. Lat. 50. 30.

COMITATUS, in *Law*, a county. Ingulphus tells us, that England was firſt divided into counties by King Alfred; and the counties into hundreds, and theſe again into tythings: and Forteſcue writes, that *regnum Angliæ per comitatus, ut regnum Franciæ per ballivatus diſtinguitur.* Sometimes it is taken for a territory or juriſdiction of a particular place; as in Mat. Paris, anno 1234. See COUNTY.

COMITIA, in Roman antiquity, were general aſſemblies of the people, lawfully called by ſome magiſtrate for the enjoinment or prohibition of any thing by their votes.

The proper comitia were of three ſorts; *curiata*, *centuriata*, and *tributa;* with reference to the three grand diviſions of the city and people into *curiæ*, *centuriæ*, and *tribes:* For, by comitia *calata*, which we ſometimes meet with in authors, in earlier times were meant all the comitia in general; the word *calata* from καλειν, or *calo*, being their common epithet; though it was at laſt reſtrained to two ſorts of aſſemblies, thoſe for the creation of prieſts, and thoſe for the regulation of laſt wills and teſtaments.

The *comitia curiata* owe their origin to the diviſion which Romulus made of the people into 30 curiæ; ten being contained in every tribe. They anſwered in moſt reſpects to the pariſhes in our cities, being not only ſeparated by proper bounds and limits, but diſtinguiſhed too by their different places ſet apart for the celebration of divine ſervice, which was performed by particular prieſts (one to every curia), with the name of *curiones*.

Before the inſtitution of the comitia centuriata, all the grand concerns of the ſtate were tranſacted in the aſſembly of the curiæ; as the election of kings and other chief officers, the making and abrogating of laws, and the judging of capital cauſes. After the expulſion of the kings, when the commons had obtained the privilege to have tribunes and ædiles, they elected them for ſome time at theſe aſſemblies; but that ceremony being at length transferred to the comitia tributa, the curiæ were never convened to give their votes, except now and then upon account of making ſome particular law relating to adoptions, wills, and teſtaments, or the creation of officers for an expedition; or for electing ſome of the prieſts, as the *flamines*, and the *curio maximus*, or ſuperintendant of the curiones, who were themſelves choſen by every particular curia.

The power of calling theſe aſſemblies belonged at firſt only to the kings; but upon the eſtabliſhment of the democracy, the ſame privilege was allowed to moſt of the chief magiſtrates, and ſometimes to the pontifices.

The perſons who had the liberty of voting here were ſuch Roman citizens as belonged to the curiæ; or ſuch as actually lived in the city, and conformed to the cuſtoms and rites of their proper curiæ; all thoſe being excluded who dwelt without the bounds of the city, retaining the ceremonies of their own country, though they had been honoured with the *jus civitatis*, or admitted free citizens of Rome. The place where the curiæ met was the *comitium*, a part of the forum: No ſet time was appointed for the holding theſe, or any other of the comitia, but only as buſineſs required.

The people being met together, and confirmed by the report of good omens from the augurs (which was neceſſary in all the aſſemblies), the rogatio, or buſineſs to be propoſed to them was publicly read. After this (if none of the magiſtrates interpoſed), upon the order of him that preſided in the comitia, the people divided into their proper curias, and conſulted of the matter; and then the curias being called out, as it happened by lot, gave their votes man by man, in ancient times *viva voce*, and afterwads by tablets; the moſt votes in every curia going for the voice of the whole curia, and the moſt curiæ for the general conſent of the people.

In the time of Cicero, the comitia curiata were ſo much out of faſhion, that they were formed only by 30 lictors repreſenting the 30 curiæ; whence, in his ſecond oration againſt Rullus, he calls them *comitia adumbrata*.

The *comitia centuriata* were inſtituted by Servius Tullius; who, obliging every one to give a true account of what he was worth, according to thoſe accounts, divided the people into ſix ranks or claſſes, which he ſubdivided into 193 centuries. The firſt claſſis, containing the equites and richeſt citizens, conſiſted of 98 centuries. The ſecond, taking in the tradeſmen and mechanics, conſiſted of 22 centuries. The third, 20. The fourth, 22. The fifth, 30. The ſixth, filled up with the poorer ſort, but one century: and this though it had the ſame name with the reſt, yet was ſeldom regarded, or allowed any power in public matters. Hence it is a common thing with the Roman authors, when they ſpeak of the claſſes, to reckon no more than five, the ſixth not being worth their notice. This laſt claſſis or order was divided into two parts or orders; the *proletarii* and the *capite cenſi*. The former, as their name implies, were deſigned purely to ſtock the republic with men, ſince they could ſupply it with ſo little money: and the latter, who paid the loweſt tax of all, were rather counted and marſhalled by their heads than by their eſtates.

Perſons of the firſt rank, by reaſon of their pre-eminence, had the name of *claſſici*; whence came the name of *claſſici auctores* for the moſt approved writers. All others, of what claſſis ſoever, were ſaid to be *infra claſſem*. The aſſembly of the people by centuries was held for the electing of conſuls, cenſors, and prætors; as alſo for the judging of perſons accuſed of what they called *crimen perduellionis*, or actions by which the party had ſhowed himſelf an enemy to the ſtate, and for the confirmation of all ſuch laws as were propoſed by the chief magiſtrates, who had the privilege of calling theſe aſſemblies.

The place appointed for their meeting was the *campus martius*; becauſe in the primitive times of the commonwealth, when they were under continual apprehenſions of enemies, the people, to prevent any ſudden aſſault, went armed, in martial order, to hold theſe aſſemblies; and were for that reaſon forbidden by the laws to meet in the city, becauſe an army was upon no account to be marſhalled within the walls; yet, in later ages, it was thought ſufficient to place a body of ſoldiers as a guard in the janiculum, where an imperial ſtandard was erected, the taking down of which denoted the concluſion of the comitia.

Though the time of holding theſe comitia for other matters was undetermined; yet the magiſtrates, after the year of the city 601, when they began to enter on their place, on the kalends of January, were conſtantly *deſigned* about the end of July and the beginning of Auguſt.

All the time between their election and confirmation they continued as private perſons, that inquiſition might be made into the election, and the other candidates might have time to enter objections, if they met with any ſuſpicion of unfair dealing. Yet, at the election of the cenſors, this cuſtom did not hold; but as ſoon as they were elected, they were immediately inveſted with the honour.

By the inſtitution of theſe comitia, Servius Tullius ſecretly conveyed the whole of the power from the commons; for the centuries of the firſt and richeſt claſs being called out firſt, who were three more in number than all the reſt put together, if they all agreed, as generally they did, the buſineſs was already decided, and the other claſſes were needleſs and inſignificant. However, the three laſt ſcarce ever came to vote.

The commons, in the time of the free ſtate, to remedy this diſadvantage, obtained, that before they proceeded to voting any matter at theſe comitia, that century ſhould give their ſuffrages firſt upon whom it fell by lot, with the name of *centuria prerogativa*; the reſt being to follow according to the order of their claſſes. After the conſtitution of the 35 tribes into which the claſſes and their centuries were divided, in the firſt place, the tribes caſt lots which ſhould be the *prerogative tribe*; and then the centuries of the tribes for the honour of being a prerogative century. All the other tribes and centuries had the appellation of *jure vocatæ*, becauſe they were called out according to their proper places.

The prerogative century being choſen by lot, the chief magiſtrate, ſitting in a tent in the middle of the campus martius, ordered that century to come out and give their voices; upon which they preſently ſeparated from the reſt of the multitude, and came into an incloſed apartment, which they termed *ſepta*, or *ovilia*, paſſing over the *pontes* or narrow boards laid there for the occaſion; on which account, *de pontibus dejici* ſignifies to be denied the privilege of voting, and perſons thus dealt with are called *depontani*.

At the higher end of the pontes ſtood the *diribitores* (a ſort of under officers ſo called from their marſhalling the people), and delivered to every man, in the election of magiſtrates as many tablets as there appeared candidates, one of whoſe names was written upon every tablet. A proper number of great cheſts were ſet ready in the *ſepta*, and every body threw in which tablet he pleaſed.

By the cheſts were placed ſome of the public ſervants, who taking out the tablets of every century, for every tablet, made a prick or a point in another tablet which they kept by them. Thus, the buſineſs being decided by moſt points, gave occaſion to the phraſe *omne tulit punctum*, and the like.

The ſame method was obſerved in the juſticiary proceſs at theſe comitia, and in the confirmation of laws; except that, in both theſe caſes, only two tablets were offered to every perſon; on one of which was written U. R. and on the other A, in capital letters; the two firſt ſtanding for *uti rogas*, "be it as you deſire," relating to the magiſtrate who propoſed the queſtion; and the laſt for *antiquo*, or "I forbid it."

It is remarkable, that though in the election of magiſtrates, and in the ratification of laws, the votes of that century, whoſe tablets were equally divided, ſignified nothing; yet in trials of life and death, if the tablets *pro* and *con* were the ſame in number, the perſon was actually acquitted.

The diviſion of people into *tribes* was an invention of Romulus, after he had admitted the Sabines into Rome; and though he conſtituted at that time only three, yet as the ſtate increaſed in power, and the city in number of inhabitants, they roſe by degrees to 35. For a long time after this inſtitution, a *tribe* ſignified no more than ſuch a ſpace of ground with its inhabitants. But at laſt the matter was quite altered, and a tribe was no longer *pars urbis*, but *pars civitatis*; not a quarter of the city, but a company of citizens living where they pleaſed. This change was chiefly occaſioned by the original difference between the tribes in point of honour. For Romulus having committed all ſordid and mechanic arts to the care of ſtrangers, ſlaves, and libertines; and reſerved the more honeſt labour of agriculture to the freemen and citizens, who by this active courſe of life might be prepared for martial ſervice; the *tribus ruſticæ* were for this reaſon eſteemed more honourable than the *tribus urbanæ*. And now all perſons being deſirous of getting into the more creditable diviſion; and there being ſeveral ways of accompliſhing their wiſhes, as by adoption, by the power of cenſors, or the like; that ruſtic tribe which had the moſt worthy names in its roll had the preference to all others, though of the ſame general denomination. Hence all of the ſame great family bringing themſelves by degrees into the ſame tribe, gave the name of their family to the tribe they honoured; whereas at firſt the generality of the tribes did not borrow their names from perſons but from places.

The firſt aſſembly of the tribes we meet with is about the year of Rome 263, convened by Sp. Sicinius, tribune of the commons, upon account of the trial of Coriolanus. Soon after, the tribunes of the commons were ordered to be elected here; and at laſt all the inferior magiſtrates, and the collegiate prieſts. The ſame comitia ſerved for the enacting of laws relating to war and peace, and all others propoſed by the tribunes and plebeian officers, though they had not properly the name of *leges*, but *plebiſcita*. They were generally convened by the tribunes of the commons; but the ſame privilege was allowed to all the chief magiſtrates. They were confined to no place; and therefore ſometimes we find them held in the comitium; ſometimes in the campus martius, and now and then in the capitol. The proceedings were in moſt reſpects anſwerable to thoſe already deſcribed in the account of the other comitia, and therefore need not be inſiſted on. Only we may farther obſerve of the comitia in general, that when any candidate was found to have moſt tablets for a magiſtracy, he was declared to be *deſigned* or elected by the preſident of the aſſembly; and this they termed *renunciari conſul, prætor*, or the like; and that the laſt ſort of the comitia only could be held without the conſent or approbation of the ſenate, which was neceſſary to the convening of the other two.

COMITIALIS MORBUS, an appellation given to the EPILEPSY, by reaſon the comitia of ancient Rome were diſſolved if any perſon in the aſſembly happened to be taken with this diſtemper.

COMITIUM, in Roman antiquity, a large hall in the forum, where the COMITIA were ordinarily held.

COMMA, among grammarians, a point or character marked thus (,), ſerving to denote a ſhort ſtop, and to divide the members of a period. Different authors define and uſe it differently. According to F. Buffier, the comma ſerves to diſtinguiſh the members of a period, in each of which is a verb and the nominative caſe of the verb: thus, "That ſo many people are pleaſed with trifles, is owing to a weakneſs of mind, which makes them love things eaſy to be comprehended." Beſides this, the comma is uſed to diſtinguiſh, in the ſame manner of a period, ſeveral nouns-ſubſtantive, or nouns-adjective, or verbs not united by a conjunction: thus, "Virtue, wit, knowledge, are the chief advantages of a man:" or, "A man never becomes learned without ſtudying conſtantly, methodically, with a guſt, application, &c." If thoſe words are united in the ſame phraſe with a conjunction, the comma is omitted: thus, "the imagination and the judgment do not always agree."

The ingenious author of the tract *De ratione interpungendi*, printed with Voſſius's Element. Rhetor. Lond. 1734, lays down the uſe of a comma to be, to diſtinguiſh the ſimple members of a period or ſentence; i. e. ſuch as only conſiſt of one ſubject, and one definite verb. But this rule does not go throughout; the ſame author inſtancing many particular caſes not yet included herein, where yet the comma is adviſable. See PUNCTUATION.

It is a general rule that a comma ought not to come between a nominative and a verb, or an adjective and ſubſtantive, when theſe are not otherwiſe disjoined: thus, in the ſentence, *God ruleth with infinite wiſdom*, a comma between *God* and *ruleth*, or between *infinite* and *wiſdom*, would be abſurd. But to this exceptions may occur; as when not a ſingle word, but a ſentence, happens to be the nominative: thus, in the example firſt above given, where the ſentence *that ſo many people are pleaſed with trifles*, forms the nominative to the verb *is*, a comma at *trifles* is proper, both for the ſake of perſpicuity, and as coinciding with a ſlight natural pauſe.

COMMA, in *Muſic*. See INTERVAL.

COMMANDINUS, FREDERIC, born at Urbino in Italy, and deſcended from a very noble family, in the 16th century. To a vaſt ſkill in the mathematics, he had added a great knowledge in the Greek tongue, by which he was well qualified to tranſlate the Greek mathematicians into Latin: accordingly he tranſlated and publiſhed ſeveral, which no writer till then had attempted; as Archimedes, Apollonius, Euclid, &c.

COMMANDRY, a kind of benefice or fixed revenue belonging to a military order, and conferred on ancient knights who had done conſiderable ſervices to the order.

There are ſtrict or regular commandries, obtained in order, and by merit; there are others of grace and favour, conferred at the pleaſure of the grand maſter; there are alſo commandries for the religious in the orders of St Bernard and St Anthony. The kings of France have converted ſeveral of the hoſpitals for lepers into commandries of the order of St Lazarus.

The commandries of Malta are of different kinds; for as the order conſiſts of knights, chaplains, and brothers ſervitors, there are peculiar commandries or revenues attached to each. The knight to whom one of theſe benefices or commandries is given is called *commander*, which agrees pretty nearly with the præpoſitus ſet over the monks in places at a diſtance from the monaſtery, whoſe adminiſtration was called *obedientia*; becauſe depending entirely upon the abbot who gave him his commiſſion. Thus it is with the ſimple commanders of Malta, who are rather farmers of the order than beneficiaries; paying a certain tribute or rent, called *reſponſio*, to the common treaſury of the order.

COMMELINA. See BOTANY *Index*.

COMMEMORATION, in a general ſenſe, the remembrance of any perſon or thing, or the doing any thing to the honour of a perſon's memory, or in remembrance of any paſt event. Thus, the euchariſt is a commemoration of the ſufferings of Jeſus Chriſt.

COMMENDAM, in the eccleſiaſtical law, the truſt or adminiſtration of the revenues of a benefice, given either to a layman, to hold by way of depoſitum for ſix months, in order to repairs, &c. or to an eccleſiaſtic or beneficed perſon, to perform the paſtoral duties thereof, till once the benefice is provided with a regular incumbent.

Anciently the adminiſtration of vacant biſhoprics belonged to the neareſt neighbouring biſhop; which is ſtill practiſed between the archbiſhopric of Lyons and the biſhopric of Autun: on this account they were called *commendatory biſhops*.

This cuſtom appears to be very ancient. St Athanaſius ſays of himſelf, according to Nicephorus, that there had been given him *in commendam*, i. e. in adminiſtration, another church beſides that of Alexandria whereof he was ſtated biſhop.

The care of churches, it ſeems, which had no paſtor, was committed to a biſhop, till they were provided with an ordinary: the regiſter of Pope Gregory I. is full of theſe commiſſions, or commendams, granted during the abſence or ſickneſs of a biſhop, or the vacancy of the ſee.

Some ſay, that Pope Leo IV. firſt eſtabliſhed the modern commendams, in favour of eccleſiaſtics who had been expelled their benefices by the Saracens; to whom the adminiſtration of the vacant churches was committed for a time, in expectation of their being reſtored; though St Gregory is ſaid to have uſed the ſame while the Lombards deſolated Italy.

In a little time the practice of commendams was exceedingly abuſed; and the revenues of monaſteries given to laymen for their ſubſiſtence. The biſhops alſo procured ſeveral benefices, or even biſhoprics, *in commendam*, which ſerved as a pretext for holding them all without directly violating the canons. Part of the abuſe has been retrenched; but the uſe of commendams is ſtill retained as an expedient to take off the incompatibility of the perſon by the nature of the benefice.

When a parſon is made biſhop, his parſonage becomes vacant; but if the king give him power he may ſtill hold it *in commendam*.

COMMENDATUS, one who lives under the protection of a great man. *Commendati homines*, were perſons who, by voluntary homage, put themſelves under the protection of any ſuperior lord: for ancient homage was either *predial*, due for ſome tenure; or *perſonal*, which was by compulſion, as a ſign of neceſſary ſubjection; or voluntary, with a deſire of protection; and thoſe who, by voluntary homage, put themſelves under the protection of any man of power, were ſometimes called *homines ejus commendati*, as often occurs in Doomſday. *Commendati dimidii* were thoſe who depended on two ſeveral lords, and paid one half of their homage to each; and *ſub-commendati* were like under-tenants under the command of perſons that were themſelves under the command of ſome ſuperior lord: alſo there were *dimidii ſub-commendati*, who bore a double relation to ſuch depending lords. This phraſe ſeems to be ſtill in uſe in the uſual compliment, "Commend me to ſuch a friend," &c. which is to let him know, "I am his humble ſervant."

COMMENSURABLE, among geometricians, an appellation given to ſuch quantities as are meaſured by one and the ſame common meaſure.

COMMENSURABLE *Numbers*, whether integers or fractions, are ſuch as can be meaſured or divided by ſome other number without any remainder; ſuch are 12 and 18, as being meaſured by 6 and 3.

COMMENSURABLE *in Power*, is ſaid of right lines, when their ſquares are meaſured by one and the ſame ſpace or ſuperfices.

COMMENSURABLE *Surds*, thoſe that being reduced to their leaſt terms, become true figurative quantities of their kind; and are therefore as a rational quantity to a rational one.

COMMENTARY, or COMMENT, in matters of literature, an illuſtration of the difficult or obſcure paſſages of an author.

COMMENTARY, or *Commentaries*, likewiſe denotes a kind of hiſtory, or memoirs of certain tranſactions, wherein the author had a conſiderable hand: ſuch are the Commentaries of Cæſar.

COMMERCE,

IS an operation by which the wealth, or work, either of individuals or of ſocieties, may be exchanged by a ſet of men called *merchants*, for an equivalent, proper for ſupplying every want, without any interruption to induſtry, or any check upon conſumption.

CHAP. I. HISTORY *of* COMMERCE.

§ 1. *General Hiſtory.*

It is a point as yet undecided by the learned, to what nation the invention and firſt uſe of commerce belonged; ſome attribute it to one people, ſome to another, for reaſons that are too long to be diſcuſſed here. But it ſeems moſt probable that the inhabitants of Arabia were thoſe that firſt made long voyages. It muſt be allowed, that no country was ſo happily ſituated for this purpoſe as that which they inhabited, being a peninſula waſhed on three ſides by three famous ſeas, the Arabian, Indian, and Perſian. It is alſo certain, that it was very early inhabited; and the firſt notice we have of any conſiderable trade refers it to the Iſhmaelites, who were ſettled in the hither part of Arabia. To them Joſeph was ſold by his brethren, when they were going down with their camels to Egypt with ſpicery, balm, and myrrh. It may ſeem ſtrange to infer from hence, that commerce was already practiſed by this nation, ſince mention is here made of camels, or a caravan, which certainly implies an inland trade: and it muſt be likewiſe allowed, that balm and myrrh were the commodities of their country. But whence had they the ſpicery? Or how came Arabia to be ſo famous in ancient times for ſpices? Or whence proceeded that miſtake of many great authors of antiquity, that ſpices actually grew there? Moſt certainly, becauſe theſe people dealt in them; and that they dealt in them the firſt of any nation that we know of, appears from this very inſtance. Strabo and many other good authors aſſure us, that in ſucceeding times they were very great traders: they tell us particularly what ports they had; what prodigious magazines they kept of the richeſt kinds of goods; what wonderful wealth they obtained; in what prodigious magnificence they lived, and into what exceſſes they fell in reſpect to their expences for carving, building, and ſtatues. All this ſhows that they were very great traders; and it alſo ſhows, that they traded to the Eaſt Indies; for from thence only they could have their ſpices, their rich gums, their ſweet-ſcented woods, and their ivory, all which it is expreſsly ſaid they had in the greateſt abundance. This therefore proves, that they had an extenſive and flouriſhing commerce; and that they had it earlier than any other nation, ſeems evident from their dealing at that time in ſpices. Beſides, there is much leſs difficulty in ſuppoſing that they firſt diſcovered the route to the Indies, than if we aſcribe that diſcovery to any other nation; for in the firſt place they lay neareſt, and in the next they lay moſt conveniently; to which we may add, thirdly, that as the ſituation of their country naturally inclined them to navigation, ſo by the help of the monſoons they might make regular voyages to and from the Indies with great facility; nor is it at all unlikely that this diſcovery might be at firſt owing to chance, and to ſome of their veſſels being blown by a ſtrong gale to the oppoſite coaſt, from whence they might take the courage to return, by obſerving the regularity of the winds at certain ſeaſons. All theſe reaſons taken together ſeem to favour this opinion, that commerce flouriſhed firſt among them; and as to its conſequences in making them rich and happy, there is no diſpute about them.

We find in the records of antiquity no nation celebrated more early for carrying all arts to perfection than the inhabitants of Egypt: and it is certain alſo, that no art was there cultivated more early, with more aſſiduity, or with greater ſucceſs, than trade. It appears from the foregoing inſtance, that the richeſt commodities were carried there by land; and it is no leſs certain, that the moſt valuable manufactures were invented and brought to perfection there many ages before they were thought of in other countries; for, as the learned Dr Warburton very juſtly obſerves, at the time that Joſeph came into Egypt, the people were not only poſſeſſed of all the conveniences of life, but were remarkable alſo for their magnificence, their politeneſs, and even for their luxury; which argues, that traffic had been of long ſtanding amongſt them. To ſay the truth, the great advantages derived from their country's lying along the Red Sea, and the many benefits that accrued to them from the Nile, which they very emphatically called *The River*, or *The River of Egypt*, and of which they knew how to make all the uſes that can be imagined, gave them an opportunity of carrying their inland trade not only to a greater height than in any country at that time, but even higher than it has been carried anywhere, China only excepted; and ſome people have thought it no trivial argument to prove the deſcent of the Chineſe from the Egyptians, that they have exactly the ſame ſort of genius, and with wonderful induſtry and care have drawn ſo many cuts and canals, that their country is almoſt in every part of it navigable. It was by ſuch methods, by a wiſe and well-regulated government, and by promoting a ſpirit of induſtry amongſt the people, that the ancient Egyptians became ſo numerous, ſo rich, ſo powerful; and that their country, for large cities, magnificent ſtructures, and perpetual abundance, became the glory and wonder of the old world.

The Phœnicians, though they poſſeſſed only a narrow ſlip of the coaſt of Aſia, and were ſurrounded by nations ſo powerful and ſo warlike that they were never able to extend themſelves on that ſide, became famous, by erecting the firſt naval power that makes any figure in hiſtory, and for the raiſing of which they took the moſt prudent and effectual meaſures. In order to this, they not only availed themſelves of all the creeks, harbours, and ports, which nature had beſtowed very liberally on their narrow territory, but improved them in ſuch a manner, that they were no leſs remarkable for their ſtrength than conſiderable for their conveniency; and ſo attentive were they to whatever might contribute to the increaſe of their power, that they were not more admired for the vaſt advantages they derived from their commerce, than they were formidable by their fleets and armies. They were likewiſe celebrated by antiquity as the inventors of arithmetic and aſtronomy; and in the laſt mentioned ſcience they muſt have been very conſiderable proficients, ſince they had the courage to undertake long voyages at a time when no other nation (the Arabians and Egyptians excepted) durſt venture farther than their own coaſts. By theſe arts Tyre and Sidon became the moſt famous marts in the univerſe, and were reſorted to by all their neighbours, and even by people at a conſiderable diſtance, as the great ſtorehouſes of the world. We learn from the Scriptures how advantageous their friendſhip and alliance became to the two great kings of Iſrael, David and Solomon; and we ſee, by the application of the latter for architects and artiſts to Hiram king of Tyre, to what a prodigious height they had carried manufactures of every kind.

It is very certain that Solomon made uſe of their aſſiſtance in equipping his fleets at Elath and Eziongeber; and it is very probable that they put him upon acquiring thoſe ports, and gave him the firſt hints of the amazing advantages that might be derived from the poſſeſſion of them, and from the commerce he might from thence be able to carry on. Theſe ports were moſt commodiouſly ſituated on the Arabian gulf; and from thence his veſſels, manned chiefly by Phœnicians, ſailed to Ophir and Tharſis, wherever thoſe places were. Some writers will needs have them to be Mexico and Peru, which is certainly a wild and extravagant ſuppoſition; others believe that we are to look for Ophir on the coaſt of Africa, and Tharſis in Spain; but the moſt probable opinion is, that they were both ſeated in the Eaſt Indies. By this adventurous navigation he brought into his country curioſities not only unſeen, but unheard of before, and riches in ſuch abundance, that, as the Scripture finely expreſſes it, "He made ſilver in Jeruſalem, as ſtones, and cedar-trees as ſycamores that grow in the plains." The metaphor is very bold and emphatical; but when we conſider that it is recorded in this Hiſtory, that the return of one voyage only to Ophir produced 450 talents of gold, which makes 51,328 pounds of our Troy weight, about 2,463,742l. ſterling, we cannot doubt of the immenſe profit that accrued from this commerce. It is alſo obſervable that the queen of Sheba,

Sheba, or Saba, which lies in that part of Arabia before mentioned, ſurpriſed at the reports that were ſpread of the magnificence of this prince, made a journey to his court on purpoſe to ſatisfy herſelf, whether fame had not exaggerated the fact; and from the preſents ſhe made him of 120 talents of gold (656,640l.), of ſpices in great abundance, and precious ſtones, we may diſcern the true reaſon of her curioſity, which proceeded from an opinion that no country could be ſo rich as her own. And there is another circumſtance very remarkable, and which ſeems ſtrongly to fortify what we have advanced in the beginning of this ſection; it is added, "neither were there any ſuch ſpices as the queen of Sheba gave to King Solomon;" which ſeems to intimate, that the Arabians had penetrated farther into the Indies than even the fleets of this famous prince, and brought from thence other ſpices (perhaps nutmegs and cloves) than had ever been ſeen before. It was by his wiſdom, and by his ſteady application to the arts of peace, all of which mutually ſupport each other, as they are all driven on by the wheel of commerce, which ſupplies every want, and converts every ſuperfluity into merchandiſe, that this monarch raiſed his ſubjects to a condition much ſuperior to that of any of their neighbours, and rendered the land of Iſrael, while he governed it, the glory and wonder of the Eaſt. He made great acquiſitions without making wars; and his ſucceſſor, by making wars, loſt thoſe acquiſitions. It was his policy to keep all his people employed; and, by employing them, he provided equally for the extenſion of their happineſs, and his own power; but the following kings purſued other meaſures, and other conſequences attended them. The trade of Judea ſunk almoſt as ſuddenly as it roſe, and in proceſs of time they loſt thoſe ports on the Red Sea, upon which their Indian commerce depended.

The whole trade of the univerſe became then, as it were, the patrimony of the Phœnicians and the Egyptians. The latter monopolized that of the Indies, and, together with her corn and manufactures, brought ſuch a prodigious balance of wealth continually into the country, as enabled the ancient monarchs of Egypt to compaſs all thoſe memorable works that in ſpite of time and barbarous conquerors remain the monuments of their wiſdom and power, and are like to remain ſo as long as the world ſubſiſts. The Phœnicians drew from Egypt a great part of thoſe rich commodities and valuable manufactures which they exported into all the countries between their own and the Mediterranean ſea; they drew likewiſe a vaſt reſort to their own cities, even from countries at a great diſtance; and we need only look into the prophets Iſaiah and Ezekiel in order to be convinced that theſe governments, founded on trade, were infinitely more glorious and more ſtable than thoſe that were erected by force. All this we find likewiſe confirmed by profane hiſtories; and by comparing theſe, it is evident, that the induſtry of the inhabitants of this ſmall country triumphed over all obſtacles, procured the greateſt plenty in a barren ſoil, and immenſe riches, where, without induſtry, there muſt have been the greateſt indigence. It is true, that Old Tyre was deſtroyed by Nebuchadnezzar, but not till ſhe had flouriſhed for ages; and even then ſhe fell with dignity, and after a reſiſtance that ruined the army of the great conqueror of Aſia. Out of the aſhes of this proud city the great ſpirit of its inhabitants produced a phœnix, little, if at all, inferior in beauty to its parent. New Tyre was ſituated on an iſland; and though her bounds were very narrow, yet ſhe became quickly the miſtreſs of the ſea, and held that ſupreme dominion till ſubdued by Alexander the Great, whom no power could reſiſt. The ſtruggle ſhe made, however, though unſucceſsful, was great, and very much to the honour of her inhabitants: it muſt be owned, that the Greek hero found it more difficult to maſter this ſingle place, than to overcome the whole power of Perſia.

The views of the Macedonian prince were beyond compariſon more extenſive than his conqueſts; and whoever conſiders Alexander's plan of power, and enters into it thoroughly, will think him more a politician than he was a conqueror. He framed in his own mind an idea of univerſal monarchy, which it was indeed impoſſible to accompliſh; but the very notion of it does him far greater honour than all his victories. He thought of placing his capital in Arabia; and of diſpoſing things in ſuch a manner, as to have commanded the moſt remote parts of the Indies, at the ſame time that he maintained a connexion with the moſt diſtant countries in Europe. He was for making uſe of force to acquire, but he very well knew, that commerce only could preſerve, an empire, that was to have no other limits than thoſe which nature had aſſigned the world. He deſired to be maſter of all; but at the ſame time he was willing to be a wiſe and gracious maſter, and to place his happineſs in that of his people, or rather in making all the nations of the earth but one people. A vaſt, an extravagant, an impracticable ſcheme it was, of which he lived not long enough to draw the outlines; but the ſample he left in his new city of Alexandria ſufficiently ſhows how juſt and how correct his notions were, and how true a judgment he had formed of what might be effected by thoſe methods upon which he depended. That city, which he might be ſaid to deſign with his own hand, and which was built, as it were, under his eye, became in ſucceeding times all that he expected, the glory of Egypt, and the centre of commerce for ſeveral ages.

While Tyre was in the height of her glory, and had no rival in the empire of the ſea, ſhe founded her noble colony of Carthage on the coaſt of Africa. The ſituation of the city was everywhere admirable, whether conſidered in the light of a capital, of a ſtrong fortreſs, or of a commodious port. It was equally diſtant from all the extremities of the Mediterranean ſea, had a very fine country behind it, and was not in the neighbourhood of any power capable of reſtraining its commerce or its growth. It is almoſt inexpreſſible how ſoon its inhabitants became not only numerous and wealthy, but potent and formidable. By degrees they extended themſelves on all ſides, conquered the beſt part of Spain, and erected there a new Carthage; the iſlands of Sicily and Sardinia, or at leaſt the beſt part of them, ſubmitted likewiſe to their yoke. Their conqueſts, however, were inconſiderable in extent, when compared with their navigation. On one ſide they ſtretched as far weſtward as Britain; and the Scilly iſlands, which are now ſo inconſiderable, were to them an Indies, the route to which they uſed the utmoſt induſtry to conceal. On the other hand, they diſcovered a great part of the coaſt of Africa, the Canary iſlands; and ſome there are who believe they firſt found the way to America. While they confined themſelves to trade, and the arts which belonged thereto, their power was continually increaſing; but when induſtry gave way to luxury, and a ſpirit of ambition baniſhed their old maxims of frugality and labour, their acquiſitions remained at a ſtand. The Romans began to grow jealous of their naval power, which it coſt them two obſtinate wars of 40 years continuance to humble. When ſhe was at length deſtroyed, her very ruins were majeſtic; for at the beginning of the third fatal Punic war, this city contained 700,000 inhabitants alone, and had 300 cities in Africa under her dominion. Such was the empire of Carthage, raiſed entirely by commerce: and to which, if ſhe had been content to have applied herſelf with the ſame ſteadineſs in her higheſt proſperity as in her early beginnings, there is no doubt ſhe had preſerved her freedom much longer than ſhe did; for as economy, diligence, and good faith, are the pillars of a commercial ſtate; ſo when theſe are once ſhaken, it is not only natural that ſhe ſhould decline, but alſo unavoidable.

The Ptolemies, who were the ſucceſſors of Alexander in Egypt, entered deeply into that hero's ſcheme, and reaped the benefit of his wiſe eſtabliſhment. Ptolemy Philadelphus, by encouraging trade, made his ſubjects immenſely rich, and himſelf inexpreſſibly powerful. We are told by an ancient author, that he had 120 galleys of war of an enormous ſize, and upwards of 4000 other veſſels, ſmall and great. This would appear incredible, if other wonders were not related of him, which ſeem to explain and confirm theſe. He raiſed a new city on the coaſt of the Red ſea; he was at an immenſe expence in opening harbours, conſtructing quays, in raiſing inns at proper diſtances on the road, and in cutting a canal from ſea to ſea. A prince who comprehended the importance of commerce to a degree that induced him to dare ſuch expences as theſe, might have what treaſures, what armies, what fleets he pleaſed. In his time, Alexandria appeared in pomp and ſplendor. She owed her birth to Alexander; but it was Ptolemy, who caught a double portion of his maſter's ſpirit, which raiſed her to that magnificence that ages could not deface. We may gueſs at what ſhe was in her glory, by what we are told was the produce of her cuſtoms, which fell little ſhort of two millions of our money annually; and yet we cannot ſuppoſe that Ptolemy, who underſtood trade ſo well, would cramp it by high duties, or extravagant impoſitions. When the revenue of the prince from a ſingle port was ſo great, what muſt have been the riches of his ſubjects?

But what ſhows us Alexandria in the higheſt point of light, is the credit ſhe maintained after Egypt ſunk from an empire into a province. The Romans themſelves were ſtruck with the majeſty of her appearance; and though till then they had little regarded traffic, yet they were not long before they comprehended the advantages of ſuch a port, and ſuch a mart as Alexandria; they confirmed her privileges, they protected her inhabitants, they took every meaſure poſſible to preſerve her commerce; and this with ſo good an effect, that ſhe actually preſerved it longer than Rome herſelf could preſerve her power. She followed, indeed, the fortune of the empire, and became at laſt dependent upon Conſtantinople, when its founder removed thither the capital of the empire; and his ſucceſſor found means to transfer alſo a part of the trade of Alexandria to the ſame place. Yet this city continued ſtill to hold up her head, and though ſhe ſunk under the barbarous power of the Arabs, yet they grew poliſhed by degrees; by degrees ſhe recovered ſomewhat of her ancient pre-eminence; and though ſhe never roſe to any thing like her former luſtre, yet ſhe remained the centre of what little trade there was in the world; which is more than can be ſaid of almoſt any place that has fallen under the Mohammedan power.

When the Roman empire was overrun by barbarians, and arts and ſciences ſunk with that power which had cultivated and protected them, commerce alſo viſibly declined; or, to ſpeak with greater propriety, was overwhelmed and loſt. When that irruption of various nations had driven the Roman policy out of the greateſt part of Europe, ſome ſtraggling people, either forced by neceſſity, or led by inclination, took ſhelter in a few ſtraggling iſlands that lay near the coaſt of Italy, and which would never have been thought worth inhabiting in a time of peace. This was in the 6th century; and at their firſt fixing there they had certainly nothing more in view than living in a tolerable ſtate of freedom, and acquiring a ſubſiſtence as well as they could. Theſe iſlands being divided from each other by narrow channels, and thoſe channels ſo encumbered by ſhallows that it was impoſſible for ſtrangers to navigate them, theſe refugees found themſelves tolerably ſafe; and uniting amongſt themſelves for the ſake of improving their condition, and augmenting their ſecurity, they became in the 8th century a well-ſettled government, and aſſumed the form of a republic.

Simple and mean as this relation may appear, yet it is a plain and true account of the riſe, progreſs, and eſtabliſhment of the famous and potent republic of Venice. Her beginnings were indeed weak and ſlow; but when the foundation was once well laid, her growth was quick, and the increaſe of her power amazing. She extended her commerce on all ſides; and taking advantage of the barbarous maxims of the Mohammedan monarchies, ſhe drew to herſelf the profits of the Indian trade, and might, in ſome ſenſe, be ſaid to make Egypt a province, and the Saracens her ſubjects. By this means her traffic ſwelled beyond conception; ſhe became the common mart of all nations; her naval power arrived at a prodigious height; and making uſe of every favourable conjuncture, ſhe ſtretched her conqueſt not only over the adjacent terra firma of Italy, but through the iſlands of the Archipelago, ſo as to be at once miſtreſs of the ſea, of many fair and fruitful countries, and of part of the great city of Conſtantinople itſelf. But ambition, and the deſire of lording it over her neighbours, brought upon her thoſe evils which firſt produced a decay of trade and then a declenſion of power. General hiſtories indeed aſcribe this to the league of Cambray, when all the great powers in Europe combined againſt this republic; and in truth, from that period the ſinking of her power is truly dated; but the Venetian writers very juſtly obſerve, that though this effect followed the league, yet there was another more latent, but at the ſame time a more effectual cauſe, which was, the falling off of their commerce; and they have ever ſince been more indebted to their wiſdom than their power; to the prudent concealing of their own weakneſs, and taking advantage of the errors of their enemies, than to any other cauſe, for their keeping up that part which they ſtill bear, and which had been loſt long ago by any other nation but themſelves.

At the ſame time that Venice roſe, as it were, out of the ſea, another republic was erected on the coaſt of Italy. There could not well be a worſe ſituation than the narrow, marſhy, unprofitable, and unwholeſome iſlands in the Adriatic, except the rocky, barren, and inhoſpitable ſhores of Liguria; and yet as commerce raiſed Venice the Rich on the one, ſo ſhe erected Genoa the Proud on the other. In ſpite of ambitious and warlike neighbours, in ſpite of a confined and unproducing country, and, which were ſtill greater impediments, in ſpite of perpetual factions and ſucceſſive revolutions, the trade of Genoa made her rich and great. Her merchants traded to all countries, and throve by carrying the commodities of the one to the other. Her fleets became formidable; and, beſides the adjacent iſland of Corſica, ſhe made larger and important conqueſts. She fixed a colony at Caffa, and was for ſome time in poſſeſſion of the coaſts on both ſides of the Black ſea. That emulation which is natural to neighbouring nations, and that jealouſy which riſes from the purſuit of the ſame miſtreſs, commerce, begat continual wars between theſe rival republics; which, after many obſtinate and bloody battles, were at laſt terminated in favour of Venice, by that famous victory of Chiozzo gained by her doge Andrew Contarini, from which time Genoa never pretended to be miſtreſs of the ſea. Theſe quarrels were fatal to both; but what proved more immediately deſtructive to the Genoeſe, was their avarice, which induced them to abandon the fair profits of trade for the ſake of that vile method of acquiring wealth by uſury. All Italy is now ſubject to France.

But we muſt now look to another part of the world. In the middle age of the German empire, that is, about the middle of the 13th century, there was formed a confederacy of many maritime cities, or at leaſt of cities not far from the ſea. This confederacy ſolely regarded commerce, which they endeavoured to promote and extend, by intereſting therein a great number of perſons, and endeavouring to profit by their different views and different lights. Though the cities of Germany held the principal rank in the Teutonic Hanſe, they did not however forbear aſſociating many other cities, as well in France as in England and in the Low Countries; the whole, however, without hurting the authority, without prejudice to the rights of the ſovereign on whom they depend. This confederacy had its laws, its ordinances, and its judgments, which were obſerved with the ſame reſpect as the maritime code of the Rhodians, who paſſing for the ableſt ſeamen in all antiquity, their conſtitutions were obſerved by the Greeks and Romans. The Teutonic Hanſe grew in a ſhort time to ſo high a rank in power and authority by the immenſe riches it acquired, that princes themſelves rendered it a ſincere homage from principles of eſteem and admiration. Thoſe of the north principally had frequent occaſion for their credit, and borrowed of them conſiderable ſums. The grand maſters of the Teutonic order, who were at that time ſovereigns of Livonia, declared themſelves conſervators of the rights and privileges of the Hanſe: all ſucceeded, not only to, but beyond their wiſhes; and Germany, charmed with their progreſs, looked on them with the ſame eyes as a curious gardener does on certain rare plants, though not of his own raiſing and culture. The kings of France and England granted alſo various privileges to the Teutonic confederacy; they exempted their veſſels in caſe of ſhipwreck from all demands whatſoever from the admiralty, or from private perſons; they forebade any diſturbance to their navigation at all times, and even when France was at war with the emperor, or the princes of the north. In fine, during the courſe of thoſe unhappy wars which were ſtyled *Croiſades*, the Hanſe was ſignally conſulted, and gave always puiſſant ſuccours in money and in ſhips to the Chriſtians oppreſſed by infidels. It is aſtoniſhing, that cities at ſo great a diſtance from each other, ſubject to different kings, ſometimes in open war, but always jealous of their rights, ſhould be able to confederate and live together in ſo ſtrict an union. But when this union had rendered them very rich and powerful, it cannot ſeem at all ſtrange, that on the one hand they grew arrogant and overbearing, took upon them not only to treat with ſovereigns on the foot of equality, but even to make war with them, and more than once with ſucceſs. It will, on the other hand, appear ſtill leſs ſtrange, that ſuch behaviour as this awakened various princes to a more particular view of the dangers that ſuch a league might produce, and the advantages that would naturally flow to their reſpective ſtates, by recovering their trade thus made over, at leaſt in ſome part to others, entirely to themſelves; and theſe, in few words, were the cauſes of the gradual declenſion of the Hanſeatic alliance, which is now totally diſſolved, although the cities of Lubeck, Hamburgh, and Bremen, maintain ſufficient marks of that ſplendor and dignity with which this confederacy was once adorned.

We muſt now turn our eyes to Portugal and Spain, where in the ſpace of about 50 years there happened a train of events which gradually led on to ſuch diſcoveries as changed the whole face of affairs in the commercial world, and gave to the knowledge of later ages what for ſome thouſand years had been kept ſecret from all mankind; we mean a perfect and diſtinct notion of that terraqueous globe which they inhabit. The kingdom of Portugal was ſmall, but well cultivated, very populous, and bleſſed with a variety of good ports; all which, however, had ſtood them in little ſtead, if they had not had a ſucceſſion of wiſe princes who, inſtead of involving themſelves in war with their neighbours to gratify their ambition, endeavoured to extend the happineſs and wealth of their ſubjects, and conſequently their own power, in the ſofter and more ſucceſsful method of protecting arts and ſciences, encouraging induſtry, and favouring trade. This, with the convenient ſituation of their country, in the beginning of the 15th century, prompted ſome lively ſpirits to attempt diſcoveries; and theſe, countenanced by a heroic young prince, puſhed on their endeavours with ſuch ſucceſs, that ſtep by ſtep the coaſt of Africa was ſurveyed as far as the Cape of Good Hope, to which they gave that name. The point they had in view was a new route to the Eaſt Indies, which Vaſquez de Gama happily diſcovered; and in a ſhort ſpace of time Portugal, from one of the leaſt conſiderable, grew to be one of the richeſt powers in Europe, gained prodigious dominions in Aſia and Africa, and raiſed a naval power ſuperior to any thing that had been ſeen for many ages before.

See Columbus (Chriſtopher.)

But while this was doing, Chriſtopher Columbus, a Genoeſe of great capacity, though of almoſt unknown original, who had been bred to the ſea from his youth, and who had carefully ſtudied what others made a trade, formed in his mind the amazing project of counteracting experience, and ſailing to the Indies by a weſtern courſe. He offered this project to the Portugueſe, by whom it was conſidered and rejected as a chimera. He propoſed it afterwards to other ſtates, but with no better fortune; and at laſt owed the diſcovery of the New World to the high ſpirit of a heroine, the famous Iſabella queen of Caſtile, who almoſt at her own expence, and with very little countenance from her huſband, who yet was ſtyled *Ferdinand the Wiſe*, furniſhed the adventurous Columbus with that poor ſquadron, with which at once, in ſpite of all the difficulties that the envy of his officers, and the obſtinacy of his mutinous crew, threw in his way, he perfected his deſign, and laid open a new Indies, though in reality he aimed at the diſcovery of the old. Neither was this noble effort of his matchleſs underſtanding defeated; for after his deceaſe, Ferdinand Magellan, a Portugueſe, propoſed to the emperor Charles V. the diſcovery of a paſſage to the ſpice iſlands by the South ſeas, which was what Columbus aimed at; and though Magellan lived not to return, yet in one voyage the diſcovery was perfected. It is inconceivable almoſt how many and how great benefits accrued to Europe from theſe diſcoveries; of which, however, it is certain, that the Portugueſe made a very indifferent, and the Spaniards a much worſe, uſe; the former making ſlaves of, and the latter rooting out the natives. This, as it was a moſt ungrateful return to divine Providence for ſo high a bleſſing; ſo it might have been eaſily foreſeen it would prove, as experience has ſhown it did prove, highly prejudicial to their own intereſts, by depopulating very fine countries, which have been thereby turned into deſerts: and though on their firſt diſcovery infinite treaſures were returned from them, which were coined in the mints of Spain; yet by an obſtinate purſuit of this falſe policy, the Spaniſh iſlands in the Weſt Indies are now brought ſo low as to be ſcarce worth keeping. The conſequences that naturally followed on the diſcovery of a paſſage by the Cape of Good Hope, and of a fourth part of the globe in the weſtern hemiſphere, were, as it has been already hinted, the cauſe of an entire change in the ſtate of Europe, and produced, not only in Portugal and Spain, but in moſt other nations, a deſire of viſiting theſe remote parts, of eſtabliſhing colonies and manufactures; of exporting and importing commodities, and of raiſing, ſettling, and protecting new manufactures. By this means, as the reader cannot but perceive, not only particular nations brought about ſignal advantages to themſelves, but Europe in general received a laſting and invaluable benefit; for its potentates made themſelves formidable, and even terrible, in thoſe diſtant parts of the earth, where their fame had hardly reached before. It is however true, that this has not been carried on as high as it might have been; for though there was room enough for every nation to have had its ſhare, and though it might be demonſtrated that the good of the whole would have contributed ſufficiently to the profit of every ſtate, the ſubjects of which had engaged in this traffic; yet, inſtead of proſecuting ſo natural and ſo equitable a meaſure, they have taken a quite contrary courſe; and by decrying, attacking, and deſtroying each other, have very much leſſened that prodigious reverence which the Aſiatics, Africans, and Americans, at firſt had for the inhabitants of Europe.

The naval power of the Portugueſe received an incurable wound by falling under the power of the Spaniards; and though human policy would have ſuggeſted, that this alone muſt have raiſed the latter to the monopoly of commerce, and the univerſal dominion of the ſea; yet the very purſuit of a deſign ſo viſibly detrimental to the intereſt of mankind, proved very quickly their ruin alſo. For the Spaniards, from the natural haughtineſs of their temper, miſled by the boundleſs ambition of their princes, and endeavouring to become the lords of Europe, forced other nations in their own defence to make a much quicker progreſs in navigation than otherwiſe they could have done. For the Engliſh and Dutch, who till this time ſeemed blind to the advantages of their ſituation, had their eyes opened by the injuries they received; and by degrees the paſſion of revenge inſpired them with deſigns that poſſibly public ſpirit would never have excited. In ſhort, the pains taken by Spain to keep all the riches that flowed from theſe diſcoveries to herſelf, and the dangerous, deteſtable, and deſtructive purpoſes to which ſhe applied the immenſe wealth that flowed in upon her from them, produced effects directly oppoſite to thoſe which ſhe propoſed, and made her enemies rich, great, powerful, and happy, in proportion as her commerce dwindled away, and as her naval power ſunk and crumbled to pieces, merely by an improper diſplay, an ill-managed exertion, and a wrong application of it.

It was from hence that the inhabitants of the Seven Provinces, whom her oppreſſion had made poor, and her ſeverities driven mad, became firſt free, then potent, and by degrees rich. Their diſtreſſes taught them the neceſſity of eſtabliſhing a moderate and equal government; the mildneſs of that government, and the bleſſings which it procured to its ſubjects, raiſed their number, and elevated their hopes. The conſequences became quickly viſible, and in a ſhort time amazing both to friends and enemies; every fiſhing village improved into a trading-town; their little towns grew up into large and magnificent cities; their inland boroughs were filled with manufactures; and in leſs than half a century the diſtreſſed States of

Holland became high and mighty; nay, in ſpite of the dangers and expences which attended a war made all that time againſt a ſuperior force, theſe people, ſurrounded with enemies, loaded with taxes, expoſed to perſonal ſervice, and to a thouſand other diſadvantages, grew up to ſuch a ſtrength as not only made the Spaniards deſpair of reducing them any more under their dominion, but inclined them to wiſh, and at laſt forced them to ſolicit, their friendſhip.

This, at leaſt as far as either ancient or modern hiſtories inform us, was the quickeſt and ſtrongeſt of all the productions of commerce that the world has ever ſeen. For it is beyond diſpute that the republic of the United Provinces owes her freedom, her power, and her wealth, entirely to induſtry and trade. The greateſt part of the country is far from being fertile: and what is ſo, produces not enough to ſuffice the tenth part of the inhabitants for the tenth part of the year: the climate is rather tolerable than wholeſome; and its havens are rather advantageous from the difficulty of entering them, than from their commodiouſneſs in any other reſpect. Of native commodities they have few or none; timber and maritime ſtores are entirely wanting; their country cannot boaſt ſo much as of a coal-mine; and yet theſe provinces, upon which nature has beſtowed ſo little, in conſequence of an extenſive trade, are enriched with all things. Their ſtorehouſes are full of corn, even when the harveſt in corn-countries fails; there is no commodity, however bulky, or ſcarce and hard to come at, which may not be had from their magazines. The ſhipping of Holland is prodigious; and to ſee the quantities of naval ſtores with which their yards and ports abound, aſtoniſhes thoſe who are unacquainted with the vigour of that cauſe which produces this abundance. But above all, the populouſneſs of this country is the greateſt miracle. That men ſhould reſort to a Canaan, and deſire to live in a land flowing with milk and honey, is nothing ſtrange; but that they ſhould make it their choice to force nature, to raiſe palaces, lay out gardens, dig canals, plant woods, and ranſack all the quarters of the earth for fruit and flowers, to produce an artificial paradiſe in a dead plain, or upon an ungrateful heath in the midſt of fogs and ſtanding lakes, would in ſo critical an age as this paſs for a fable, if the country did not lie ſo near us as to put the truth of it out of queſtion. It is now ſubject to France.

§ 2. *Britiſh Hiſtory.*

We may eaſily conceive, that foreign commerce by the natives of this iſland muſt have been a work of time; for men firſt think of neceſſaries, then of conveniencies, and laſt of ſuperfluities. Thoſe who came originally from the continent might have better notions of things; but as it muſt be preſumed that either fear or indigence drove them hither, ſo it is eaſy to apprehend that ſucceeding generations muſt for ſome time ſink much below their anceſtors in their notions of the commodities of life; and, deriving their manners from their circumſtances, become quite another ſort of people. But thoſe on the oppoſite continent, knowing that this iſland was inhabited, and having the uſe, though in ever ſo imperfect a degree, of veſſels, and of foreign traffic, came over hither, and bartered their goods for the raw commodities of the Britons, till by degrees perhaps they taught the latter to make ſome improvement in thoſe ſlight leather and wicker boats, which they uſed for paſſing their own rivers, and creeping along their coaſts, till at laſt they ventured themſelves over to Gaul, and entered upon ſome kind of correſpondence with their neighbours. All this is ſo deducible from the laws of nature, that we might have conceived thus much by the light of reaſon, if we had not the commentaries of Cæſar to guide us, and to ſtrengthen by the authority of hiſtory, the facts that might have been found out by the force of rational conjecture.

Things were preciſely in this ſituation when the Romans invaded Britain; and there is no doubt that our anceſtors falling under the power of that empire, and under its power at a time when, with reſpect to arts and ſciences, it was in a moſt flouriſhing condition, was a great advantage to them; and though from their love of civil liberty, which, when under the direction of reaſon, is the moſt natural and laudable of all paſſions, they made a long and vigorous, and in ſome ſenſe a noble and glorious, reſiſtance; yet by degrees they caught the manners and cuſtoms of their conquerors, and grew content to be happy rather than free. With learning and politeneſs the Romans introduced foreign commerce; and according to the nature of their policy, as they made high roads through the iſland, eſtabliſhed colonies in proper places, and fixed ſtanding camps, which were a kind of fortreſſes, where they thought proper; ſo they were no leſs careful with regard to marts or emporiums for the conveniency of traders, and of which what they found was uncertain; but that they left many, is without queſtion; and among the reſt London, which is not more famous for her preſent extenſive trade, than venerable for her unrecorded antiquity.

When the Romans unwillingly left Britain, and the Britons as unwillingly made way for the Saxons, a new deluge of barbarity overflowed this iſland: almoſt all the improvements of our civilized conquerors were effaced; and upon the eſtabliſhment as it were of a new people, things were all to begin again. This neceſſarily took up a great deal of time; and before they were in any tolerable poſture, the Saxons found themſelves diſtreſſed by freſh ſwarms of barbarians. Yet there ſtill remain ſome evidences of their having been acquainted with, inclined to, and, if their circumſtances would have permitted, moſt certainly would have entered upon and carried foreign commerce to a great height. We have authentic teſtimonies, that Alfred the Great formed projects of vaſt diſcoveries to the North, as he actually ſent perſons of great prudence and abilities into the Eaſt; and the curioſities which they brought home were for many ages preſerved in the treaſury of the church of Saliſbury.

As for the Danes, they were not long our maſters; but as they became ſo by a maritime force, and as their countrymen had eſtabliſhed themſelves not only on the oppoſite ſhore of France, but in other parts of Europe, it is reaſonable to believe that they held ſome correſpondence with them from thence; and that, if their dominion had laſted longer, this might have been better regulated, and productive of many advantages. But they had ſoon to do with their brethren in another way; for the Normans, men of the ſame race, but better eſtabliſhed in another country, diſpoſſeſſed them here; and partly under colour of right, partly by force, erected that monarchy, which, not without various alterations and changes, ſubſiſts even to our times, and to the ſubſiſtence of which, with the help of thoſe changes and alterations, we owe that happy conſtitution under which we live; that univerſal improvment which adorns the face of our country; that domeſtic trade which nouriſhes ſo numerous a people, by plentifully rewarding their induſtry; and that extenſive commerce which is at once the ſource of our wealth and the ſupport of our liberty.

It cannot be expected, that in a work like this we ſhould attempt to trace the progreſs of trade through every reign; ſhow how it was encouraged and protected, or diſcountenanced and checked; what occaſions were luckily ſeized, or what opportunities unfortunately loſt. It may be ſufficient for us, after what has been already ſaid, to obſerve, that the opinion commonly entertained, of our having little or no trade before the reign of Queen Elizabeth, is very far from being well founded.

In fact, the reign of that princeſs was great and glorious in whatever light we conſider it; but it was moſt ſo in this, that, under Providence, it became great and glorious by the wiſdom and prudence of the queen and her miniſters. The Engliſh nation never was in ſo deſperate a condition as at her acceſſion. The crown was in debt, the treaſury empty, the nation involved in a foreign war directly againſt her own intereſts, her coaſts naked; in a word, without credit abroad, and without concord at home, no ſettled religion, the great men ſplit into factions, and the common people diſtracted and dejected. Sad circumſtances theſe! and yet from hence aroſe the grandeur of that reign, and the eſtabliſhment of our commerce. The queen found herſelf obliged to act with great caution, to derive aſſiſtance from every quarter, to employ it faithfully, and to promote to the utmoſt of her power the welfare of her ſubjects, whom nothing but the public-ſpiritedneſs of her government could enable to grow rich enough to ſupport the neceſſary expences of the crown. It was this gave a popular turn to her councils. She encouraged her ſubjects to arm againſt the Spaniards, that they might be accuſtomed to the ſea, and acquire that knowledge in navigation, with which till then, they had been unacquainted. She paſſed many laws for the public good, erected ſeveral companies, and ſaw that thoſe companies purſued the ends for which they were erected; in ſhort, ſhe did every thing that could be expected, during the whole courſe of her reign, to excite and encourage induſtry at home, and to enable us to make a proper figure abroad. In a word, ſhe furniſhed us with ſtock and credit, put us upon improving our commodities and manufactures, brought the art of ſhip-building amongſt us, filled our ports with able ſeamen, ſhowed a juſt reſpect to Engliſh merchants, reduced Ireland ſo as to render it beneficial to Britain, and approved our ſending colonies into America; and thus the ſeeds of Britiſh wealth were ſown in her time, though the harveſt was reaped in the days of her ſucceſſors. See the articles Coalery, Colony, Fisheries, Manufactures, Shipping, and Trade.

Chap. II. Principles *of* Commerce.

Sect. I. *Origin of Trade.*

The moſt ſimple of all trade is that which is carried on by bartering the neceſſary articles of ſubſiſtence. If we ſuppoſe the earth free to the firſt poſſeſſor, this perſon who cultivates it will firſt draw from it his food, and the ſurplus will be the object of barter: he will give this in exchange to any one who will ſupply his other wants. This naturally ſuppoſes both a ſurplus quantity of food produced by labour, and alſo free hands; for he who makes a trade of agriculture cannot ſupply himſelf with all other neceſſaries, as well as food; and he who makes a trade of ſupplying the farmers with ſuch neceſſaries, in exchange for his ſurplus of food, cannot be employed in producing that food. The more the neceſſities of man increaſe, the more free hands are required to ſupply them; and the more free hands are required, the more ſurplus food muſt be produced by additional labour, to ſupply their demand.

This is the leaſt complex kind of trade, and may be carried on to a greater or leſs extent, in different countries, according to the different degrees of the wants to be ſupplied. In a country where there is no money, nor any thing equivalent to it, the wants of mankind will be confined to few objects; to wit, the removing the inconveniences of hunger, thirſt, cold, heat, danger, and the like. A free man, who by his induſtry, can procure all the comforts of a ſimple life, will enjoy his reſt, and work no more; and, in general, all increaſe of work will ceaſe, ſo ſoon as the demand for the purpoſes mentioned comes to be ſatisfied. There is a plain reaſon for this. When the free hands have procured, by their labour, wherewithal to ſupply their wants, their ambition is ſatisfied: ſo ſoon as the huſbandmen have produced the neceſſary ſurplus for relieving theirs, they work no more. Here then is a natural ſtop put to induſtry, conſequently to bartering.

The next thing to be examined is, how bartering grows into trade, properly ſo called, and underſtood, according to the definition given of it above; how trade comes to be extended among men; how manufactures, more ornamental than uſeful, come to be eſtabliſhed; and how men come to ſubmit to labour, in order to acquire what is not abſolutely neceſſary for them.

This, in a free ſociety, is chiefly owing to the introduction of money, and a taſte for ſuperfluities in thoſe who poſſeſs it.

In ancient times, money was not wanting; but the taſte for ſuperfluities not being in proportion to it, the ſpecie was locked up. This was the caſe in Europe four hundred years ago. A new taſte for ſuperfluity has drawn, perhaps, more money into circulation, from our own treaſures, than from the mines of the new world. The poor opinion we entertain of the riches of our forefathers, is founded upon the modern way of eſtimating wealth, by the quantity of coin in circulation, from which we conclude, that the greateſt part of the ſpecie now in our hands muſt have come from America.

It is more, therefore, through the taſte of ſuperfluity, than in conſequence of the quantity of coin, that trade comes to be eſtabliſhed; and it is only in conſequence of trade that we ſee induſtry carry things in our days to ſo high a pitch of refinement and delicacy. Let us illuſtrate this, by comparing together the different operations of barter, ſale, and commerce.

When reciprocal wants are ſupplied by barter, there is not the ſmalleſt occaſion for money: this is the moſt ſimple of all combinations.

When wants are multiplied, bartering becomes more difficult: upon this money is introduced. This is the common price of all things: it is a proper equivalent in the hands of thoſe who want, perfectly calculated to ſupply the occaſions of thoſe who, by induſtry, can relieve them. This operation of buying and ſelling is a little more complex than the former; but ſtill we have here no idea of trade, becauſe we have not introduced the merchant, by whoſe induſtry it is carried on.

Let this third perſon be introduced, and the whole operation becomes clear. What before we called *wants,* is here repreſented by the conſumer; what we called *induſtry*, by the manufacturer; what we called *money*, by the merchant. The merchant here repreſents the money, by ſubſtituting credit in its place; and as the money was invented to facilitate barter, ſo the merchant, with his credit, is a new refinement upon the uſe of money. This renders it ſtill more effectual in performing the operations of buying and ſelling. This operation is trade: it relieves both parties of the whole trouble of tranſportation, and adjuſting wants to wants, or wants to money; the merchant repreſents by turns both the conſumer, the manufacturer, and the money. To the conſumer he appears as the whole body of manufacturers; to the manufacturers as the whole body of conſumers; and to the one and the other claſs his credit ſupplies the uſe of money. This is ſufficient at preſent for an illuſtration. We now return to the ſimple operations of money in the hands of the two contracting parties, the buyer and the ſeller, in order to ſhow how men come to ſubmit to labour in order to acquire ſuperfluities.

So ſoon as money is introduced into a country, it becomes an univerſal object of want to all the inhabitants.

The conſequence is, that the free hands of the ſtate who before ſtopt working, becauſe all their wants were provided for, having this new object of ambition before their eyes, endeavour, by refinements upon their labour, to remove the ſmaller inconveniences which reſult from a ſimplicity of manners. People, who formerly knew but one ſort of clothing for all ſeaſons, willingly part with a little money to procure for themſelves different ſorts of apparel properly adapted to ſummer and winter, which the ingenuity of manufacturers, and their deſire of getting money, may have ſuggeſted to their invention.

Indeed theſe refinements ſeem more generally owing to the induſtry and invention of the manufacturers (who by their ingenuity daily contrive means of ſoftening or relieving inconveniences which mankind ſeldom perceive to be ſuch, till the way of removing them is contrived), than to the taſte for luxury in the rich, who, to indulge their eaſe, engage the poor to become induſtrious.

Let any man make an experiment of this nature upon himſelf, by entering into the firſt ſhop. He will nowhere ſo quickly diſcover his wants as there. Every thing he ſees appears either neceſſary, or at leaſt highly convenient; and he begins to wonder how he could have been ſo long without that which the ingenuity of the workman alone had invented, in order that from the novelty it might incite his deſire; for perhaps when it is bought, he will never once think of it more, nor ever apply it to the uſe for which at firſt it appeared ſo neceſſary.

Here then is a reaſon why mankind labour though not in want. They become deſirous of poſſeſſing the very inſtruments of luxury, which their avarice or ambition prompted them to invent for the uſe of others.

What has been ſaid repreſents trade in its infancy, or rather the materials with which that great fabric is built.

We have formed an idea of the wants of mankind multiplied even to luxury, and abundantly ſupplied by the employment of all the free hands ſet apart for that purpoſe. But if we ſuppoſe the workman himſelf diſpoſing of his work, and purchaſing with it food from the farmer, clothes from the clothier; and, in general, ſeeking for the ſupply of every want from the hands of the perſon directly employed for the purpoſe of relieving it; this will not convey an idea of trade according to our definition.

Trade and commerce are an abbreviation of this long proceſs; a ſcheme invented and ſet on foot by merchants, from a principle of gain, ſupported and extended among men, from a principle of general utility to every individual, rich or poor; to every ſociety, great or ſmall.

Inſtead of a pin-maker exchanging his pins with 50 different perſons, for whoſe labour he has occaſion, he ſells all to the merchant for money or for credit; and as occaſion offers, he purchaſes all his wants, either directly from thoſe who ſupply them, or from other merchants, who deal with manufacturers in the ſame way his merchant dealt with him.

Another advantage of trade is, that induſtrious people in one part of the country may ſupply cuſtomers in another, though diſtant. They may eſtabliſh themſelves in the moſt commodious places for their reſpective buſineſs, and help one another reciprocally, without making the diſtant parts of the country ſuffer for want of their labour. They are likewiſe expoſed to no avocation from their work, by ſeeking for cuſtomers.

Trade produces many excellent advantages; it marks out to the manufacturers when their branch is under or overſtocked with hands. If it is underſtocked, they will find more demand than they can anſwer; if it is overſtocked, the ſale will be ſlow.

Intelligent men, in every profeſſion, will eaſily diſcover when theſe appearances are accidental, and when they proceed from the real principles of trade.

Poſts, and correſpondence by letters, are a conſequence of trade; by the means of which merchants are regularly informed of every augmentation or diminution

nution of induſtry in every branch, in every part of the country. From this knowledge they regulate the prices they offer; and as they are many, they ſerve as a check upon one another, from the principles of competition.

From the current prices, the manufacturers are as well informed, as if they kept the correſpondence themſelves: the ſtateſman feels perfectly where hands are wanting, and young people deſtined to induſtry, obey, in a manner, the call of the public, and fall naturally in to ſupply the demand.

Two great aſſiſtances to merchants, eſpecially in the infancy of trade, are public markets for collecting the work of ſmall dealers, and large undertakings in the manufacturing way by private hands. By theſe means the merchants come at the knowledge of the quantity of work in the market, as on the other hand the manufacturers learn, by the ſale of the goods, the extent of the demand for them. Theſe two things being juſtly known, the price of goods is eaſily fixed.

Public ſales ſerve to correct the ſmall inconveniences which proceed from the operations of trade. A ſet of manufacturers got all together into one town, and entirely taken up with their induſtry, are thereby as well-informed of the rate of the market as if every one of them carried thither his work; and upon the arrival of the merchant, who readily takes it off their hands, he has not the leaſt advantage over them from his knowledge of the ſtate of demand. This man both buys and ſells in what is called *wholeſale*; and from him retailers purchaſe, who diſtribute the goods to every conſumer throughout the country. Theſe laſt buy from wholeſale merchants in every branch, that proportion of every kind of merchandiſe which is ſuitable to the demand of their borough, city, or province.

Thus all inconveniences are prevented, at ſome additional coſt to the conſumer, who muſt naturally reimburſe the whole expence. The diſtance of the manufacturer, the obſcurity of his dwelling, the caprice in ſelling his work, are quite removed; the retailer has all in his ſhop, and the public buys at a current price.

§ 2. *How the price of Goods is determined by Trade.*

In the price of goods, two things muſt be conſidered as really exiſting, and quite different from one another; to wit, the real value of the commodity, and the profit upon alienation.

I. The firſt thing to be known of any manufacture, when it comes to be ſold, is how much of it a perſon can perform in a day, a week, a month, according to the nature of the work, which may require more or leſs time to bring it to perfection. In making ſuch eſtimates, regard is to be had only to what, upon an average, a workman of the country in general may perform, without ſuppoſing him the beſt or the worſt in his profeſſion, or having any peculiar advantage or diſadvantage as to the place where he works.

Hence the reaſon why ſome people proſper by their induſtry, and others not; why ſome manufactures flouriſh in one place and not in another.

II. The ſecond thing to be known is, the value of the workman's ſubſiſtence, and neceſſary expence, both for ſupplying his perſonal wants and providing the inſtruments belonging to his profeſſion, which muſt be taken upon an average as above, except when the nature of the work requires the preſence of the workman in the place of conſumption; for although ſome trades, and almoſt every manufacture, may be carried on in places at a diſtance, and therefore may fall under one general regulation as to prices; yet others there are, which, by their nature, require the preſence of the workman in the place of conſumption; and in that caſe the prices muſt be regulated by circumſtances relative to every particular place.

III. The third and laſt thing to be known, is the value of the materials, that is, the firſt matter employed by the workman; and if the object of his induſtry be the manufacture of another, the ſame proceſs of inquiry muſt be gone through with regard to the firſt as the ſecond; and thus the moſt complex manufactures may be at laſt reduced to the greateſt ſimplicity.

Theſe three articles being known, the price of manufacture is determined. It cannot be lower than the amount of all the three, that is, than the real value; whatever it is higher, is the manufacturer's profit. This will ever be in proportion to demand, and therefore will fluctuate according to circumſtances.

Hence appears the neceſſity of a great demand, in order to promote flouriſhing manufactures.

By the extenſive dealings of merchants, and their conſtant application to the ſtudy of the balance of work and demand, all the above circumſtances are known to them, and are made known to the induſtrious, who regulate their living and expence according to their certain profit.

Employ a workman in a country where there is little trade or induſtry, he proportions his price always to the urgency of your want, or your capacity to pay; but ſeldom to his own labour. Employ another in a country of trade, he will not impoſe upon you, unleſs perhaps you be a ſtranger, which ſuppoſes your being ignorant of the value; but employ the ſame workman in a work not uſual in the country, conſequently not demanded, and therefore not regulated as to the value, he will proportion his price as in the firſt ſuppoſition.

We may therefore conclude, from what has been ſaid, that in a country where trade has been eſtabliſhed, manufactures muſt flouriſh, from the ready ſale, the regulated price of work, and the certain profit reſulting from induſtry. Let us next inquire into the conſequences of ſuch a ſituation.

§ 3. *How foreign Trade opens to an induſtrious People, and the conſequences of it to the Merchants who ſet it on foot.*

The firſt conſequence of the ſituation deſcribed in the preceding ſection is, that wants are eaſily ſupplied for the adequate value of the thing wanted.

The next conſequence is, the opening of foreign trade, under its two denominations of paſſive and active. Strangers and people of diſtant countries, finding the difficulty of having their wants ſupplied at home, and the eaſe of having them ſupplied from this country, immediately have recourſe to it. This is paſſive trade. The active is when merchants, who have executed this plan at home with ſucceſs, begin to tranſport the labour of their countrymen into other regions, which either produce, or are capable of producing ſuch articles of conſumption, proper to be manufactured, as are moſt demanded at home; and conſequently will meet with the readieſt ſale, and fetch the largeſt profits.

Here then is the opening of foreign trade, under its two denominations of active and paſſive.

What then are the conſequences of this new commerce to our merchants, who have left their homes in queſt of gain abroad?

The firſt is, that, arriving in any new country, they find themſelves in the ſame ſituation with regard to the inhabitants, as the workmen in the country of no trade, with regard to thoſe who employ him; that is, they proportion the price of their goods to the eagerneſs of acquiring, or the capacity of paying, in the inhabitants, but never to their real value.

The firſt profits then, upon this trade, muſt be very conſiderable; and the demand from ſuch a country will be *high* or *low*, *great* or *ſmall*, according to the ſpirit, not the real wants of the people; for theſe in all countries muſt firſt be ſupplied by the inhabitants themſelves, before they ceaſe to labour.

If the people of this not-trading country be abundantly furniſhed with commodities uſeful to the traders, they will eaſily part with them, at firſt, for the inſtruments of luxury and eaſe; but the great profit of the traders will inſenſibly increaſe the demand for the productions of their new correſpondents: this will have the effect of producing a competition between themſelves, and thereby throwing the demand on their ſide. This is perpetually a diſadvantage in traffic; the moſt unpoliſhed nations in the world quickly perceive the effects of it, and are taught to profit by the diſcovery, in ſpite of the addreſs of thoſe who are the moſt expert in commerce.

The traders will therefore be very fond of falling upon every method and contrivance to inſpire this people with a taſte of refinement and delicacy. Abundance of fine preſents, conſiſting of every inſtrument of luxury and ſuperfluity, the beſt adapted to the genius of the people, will be given to the prince and leading men among them. Workmen will even be employed at home, to ſtudy the taſte of the ſtrangers, and to captivate their deſires by every poſſible means. The more eager they are of preſents, the more laviſh the traders will be in beſtowing and diverſifying them. It is an animal put up to fatten; the more he eats, the ſooner he is fit for ſlaughter. When their taſte for ſuperfluity is fully formed, when the reliſh for their former ſimplicity is ſophiſticated, poiſoned, and obliterated, then they are ſurely in the fetters of the traders, and the deeper they go, the leſs poſſibility there is of being extricated. The preſents then will die away, having ſerved their purpoſe; and if afterwards they are found to be continued, it will probably be to ſupport the competition againſt other nations, who will incline to ſhare of the profits.

If, on the contrary, this not-trading nation does not abound with commodities uſeful to the traders, theſe will make little account of trading with them, whatever their turn may be; but, if we ſuppoſe this country inhabited by a laborious people, who, having taken a taſte for refinement from the traders, apply themſelves to agriculture, in order to produce articles of ſubſiſtence, they will ſolicit the merchants to give them part of their manufactures in exchange for thoſe; and this trade will undoubtedly have the effect of multiplying numbers in the trading nation. But if food cannot be furniſhed, nor any other branch of production found out to ſupport the correſpondence, the taſte for refinement will ſoon die away, and trade will ſtop in this quarter.

Had it not been for the furs in thoſe countries adjacent to Hudſon's Bay, and in Canada, the Europeans never would have thought of ſupplying inſtruments of luxury to thoſe nations; and if the inhabitants of thoſe regions had not taken a taſte for the inſtruments of luxury furniſhed to them by the Europeans, they never would have become ſo indefatigable nor ſo dexterous hunters. At the ſame time we are not to ſuppoſe that ever theſe Americans would have come to Europe in queſt of our manufactures. It is, therefore, owing to our merchants, that theſe nations are become in any degree fond of refinement; and this taſte, in all probability, will not ſoon exceed the proportion of the productions of their country. From theſe beginnings of foreign trade it is eaſy to trace its increaſe.

One ſtep towards this, is the eſtabliſhing correſpondences in foreign countries; and theſe are more or leſs neceſſary in proportion as the country where they are eſtabliſhed is more or leſs poliſhed, or acquainted with trade. They ſupply the want of poſts, and point out to the merchants what proportion the productions of the country bear to the demand of the inhabitants for manufactures. This communicates an idea of commerce to the not-trading nation, and they inſenſibly begin to fix a determined value upon their own productions, which perhaps bore no determined value at all before.

Let us trace a little the progreſs of this refinement in the ſavages, in order to ſhow how it has the effect of throwing the demand upon the traders, and of creating a competition among them for the productions of the new country.

Experience ſhows, that, in a new diſcovered country, merchants conſtantly find ſome article or other of its productions, which runs out to a great account in commerce; and we ſee that the longer ſuch a trade ſubſiſts, and the more the inhabitants take a taſte for European manufactures, the more their own productions riſe in their value, and the leſs profit is made by trading with them, even in caſes where the trade is carried on by companies; which is a very wiſe inſtitution for one reaſon, that it cuts off a competition between our merchants.

This is the beſt means of keeping prices low in favour of the nation; however, it may work a contrary effect with reſpect to individuals who muſt buy from theſe monopolies.

When companies are not eſtabliſhed, and when trade is open, our merchants, by their eagerneſs to profit by the new trade, betray the ſecrets of it; they enter into competition for the purchaſe of the foreign produce; and this raiſes prices, and favours the commerce of the moſt ignorant ſavages.

§ 4. *Conſequences of the Introduction of a paſſive foreign Trade among a People who live in Simplicity and Idleneſs.*

We now ſuppoſe the arrival of traders, all in one intereſt, with inſtruments of luxury and refinement, at a port in a country of great ſimplicity of manners, abundantly provided by nature with great advantages for commerce, and peopled by a nation capable of adopting a taſte for ſuperfluities.

The firſt thing the merchants do is, to expoſe their goods, and point out the advantages of many things, either agreeable or uſeful to mankind in general, ſuch as wines, ſpirits, inſtruments of agriculture, arms and ammunition for hunting, nets for fiſhing, manufactures for clothing, and the like. The advantages of theſe are preſently perceived, and ſuch commodities are eagerly ſought after.

The natives, on their ſide, produce what they moſt eſteem, generally ſomething ſuperfluous or ornamental. The traders, after examining all circumſtances, determine the object of their demand, giving the leaſt quantity poſſible in return for this ſuperfluity, in order to impreſs the inhabitants with a high notion of the value of their own commodities; but as this parſimony may do more hurt than good to their intereſt, they are very generous in making preſents, from the principles mentioned above.

When the exchange is completed, and the traders depart, regret is commonly mutual; the one and the other are ſorry that the ſuperfluities of the country fall ſhort. A return is promiſed by the traders, and aſſurances are given by the natives of a better proviſion another time.

What are the firſt conſequences of this revolution?

It is evident, that, in order to ſupply an equivalent for this new want, more hands muſt be ſet to work than formerly. And it is evident alſo, that this augmentation of induſtry will not eſſentially increaſe numbers: Why? Becauſe the produce of the induſtry is, in this caſe, intended to be exported. But, if we can find out any additional conſumption at home, even implied by this new trade, it will have the effect of augmenting numbers. An example will make this plain.

Let us ſuppoſe the ſuperfluity of this country to be the ſkins of wild beaſts, not proper for food; the manufacture ſought for, brandy. The brandy is ſold for furs. He who has furs, or he who can ſpare time to hunt for them, will drink brandy in proportion; but there is no reaſon to conclude from this ſimple operation, that one man more in the country muſt neceſſarily be fed, or that any augmentation of agriculture muſt of conſequence enſue from this new traffic.

But let us throw in a circumſtance which may imply an additional conſumption at home, and then examine the conſequences.

A poor creature who has no equivalent to offer for food, who is miſerable, and ready to periſh for want of ſubſiſtence, goes a hunting, and kills a wolf; he comes to a farmer with the ſkin, and ſays, You are well fed, but you have no brandy; if you will give me a loaf, I will give you this ſkin, which the ſtrangers are ſo fond of, and they will give you brandy. But, ſays the farmer, I have no more bread than what is ſufficient for my own family. As for that, replies the other, I will come and dig in your ground, and you and I will ſettle our account as to the ſmall quantity I deſire of you. The bargain is made: the poor fellow gets his loaf, and lives at leaſt; perhaps he marries, and the farmer gets a dram. But had it not been for this dram, that is, this new want, which was purchaſed by the induſtry of this poor fellow, by what argument could he have induced the farmer to part with a loaf?

Here the ſentiment of charity is excluded. This alone is a principle of multiplication; but as true it is, on the other hand, that could the poor fellow have got bread by begging, he would not probably have gone a hunting.

Here then it appears, that the very dawning of trade, in the moſt unpoliſhed countries, implies a multiplication. This is ſufficient to point out the firſt ſtep, and to connect the ſubject of our preſent inquiries with what has been already diſcuſſed in relation to other circumſtances.

So ſoon as all the furs are diſpoſed of, and a taſte for ſuperfluity is introduced, both the traders and the natives will be equally intereſted in the advancement of induſtry in this country. Many new objects of profit for the firſt will be diſcovered, which the proper employment of the inhabitants, in reaping the natural advantages of their ſoil and climate, will make effectual. The traders will therefore endeavour to ſet on foot many branches of induſtry among the ſavages, and the allurements of brandy, arms, and clothing, will animate theſe in the purſuit of them.

When once this revolution is brought about; when thoſe who formerly lived in ſimplicity become induſtrious; matters put on a new face.

That is to ſay, we now find two trading nations inſtead of one, with this difference, however, that as hitherto we have ſuppoſed the merchants all in one intereſt, the compound demand, that is, the competition of the buyers, has been, and muſt ſtill continue on the ſide of the natives. This is a great prejudice to their intereſt: but as it is not ſuppoſed ſufficient to check their induſtry, nor to reſtrain their conſumption of the manufactures, let us here examine a little more particularly the conſequences of the principle of demand in ſuch a ſituation; for although we allow, that it can never change ſides, yet it may admit of different modifications, and produce different effects, as we ſhall preſently perceive.

The merchants we ſuppoſe all in one intereſt, conſequently there can be no competition among them; no check can be put upon their raiſing their prices, as long as the prices they demand are complied with. So ſoon as they are raiſed to the full extent of the abilities of the natives, or of their inclination to buy, the merchants have the choice of three things, which are all perfectly in their option; and the preference to be given to the one or the other, depends entirely upon themſelves, and upon the circumſtances we are going to point out.

Firſt, they may ſupport their *high* demand; that is, not lower their price, which will preſerve a high eſtimation of the manufactures in the opinion of the inhabitants, and render the profits upon their trade the greateſt poſſible. This part they may poſſibly take, if they perceive the natives doubling their diligence, in order to become able, in time, to purchaſe conſiderable cargoes at a high value; from which ſuppoſition is inferred a ſtrong diſpoſition in the people to become luxurious, ſince nothing but want of ability prevents them from complying with the higheſt demand: but ſtill another circumſtance muſt concur, to engage the merchants not to lower their price. The great proportion of the goods they ſeek for in return, muſt be found in the hands of a few. This will be the caſe if ſlavery be eſtabliſhed; for then there muſt be many poor and few rich; and they are commonly the rich conſumers who proportion the price they offer, rather to their deſires, than to the value of the thing.

The ſecond thing which may be done is, to encourage a great demand; that is, to lower their prices. This will ſink the value of the manufactures in the opinion of the inhabitants, and render profits leſs in proportion, although indeed, upon the voyage, the profits may be greater.

This part they will take, if they perceive the inhabitants do not incline to conſume great quantities of the merchandiſe at a high value, either for want of abilities or inclination; and alſo, if the profits upon the trade depend upon a large conſumption, as is the caſe in merchandize of a low value, and ſuited chiefly to the occaſions of the lower ſort. Such motives of expediency will be ſufficient to make them relinquiſh a high demand, and prefer a great one; and the more, when there is a likelihood that the conſumption of low-priced goods in the beginning may beget a taſte for others of a higher value, and thus extend in general the taſte of ſuperfluity.

A third part to be taken is the leaſt politic, and perhaps the moſt familiar. It is to profit by the competition between the buyers, and encourage the riſing of demand as long as poſſible: when this comes to a ſtop, to make a kind of auction, by firſt bringing down the prices to the level of the higheſt bidders, and ſo to deſcend by degrees, in proportion as demand ſinks. Thus we may ſay with propriety, that demand commonly becomes great, in proportion as prices ſink. By this operation, the traders will profit as much as poſſible, and ſell off as much of their goods as the profits will permit.

But this plan, in a new diſcovered country, is not politic, as it both diſcovers a covetouſneſs and a want of faith in the merchants, and alſo throws open the ſecrets of their trade to thoſe who ought to be kept ignorant of them.

Let us next ſuppoſe, that the large profits of our merchants ſhall be diſcovered by others, who arrive at the ſame ports in a ſeparate intereſt, and who enter into no combination which might prevent the natural effects of competition.

Let the ſtates of demand among the natives be ſuppoſed the ſame as formerly, both as to height and greatneſs, in conſequence of the operation of the different principles, which might have induced our merchants to follow one or other of the plans we have been deſcribing: we muſt, however, ſtill ſuppoſe, that they have been careful to preſerve conſiderable profits upon every branch.

If we ſuppoſe the inhabitants to have increaſed in numbers, wealth, and taſte for ſuperfluity, ſince the laſt voyage, demand will be found rather on the riſing hand. Upon the arrival of the merchants in competition with the former, both will offer to ſale; but if both ſtand to the ſame prices, it is very natural to ſuppoſe, that the former dealers will obtain a preference; as *cæteris paribus* it is always an advantage to know and to be known. The laſt comers, therefore, have no other way left to counterbalance this advantage, but to lower their prices.

This is a new phenomenon: here the fall of prices is not voluntary as formerly, nor conſented to from expediency; not owing to a failure of demand, but to the influence of a new principle of commerce, to wit, a double competition, which we ſhall now examine.

§ 5. *Of double Competition.*

When competition is much ſtronger on one ſide of the contract than on the other, it is called *ſimple*. This is the ſpecies of competition which is implied in the terms *high demand*, or when it is ſaid that *demand raiſes prices*.

Double competition is, when, in a certain degree, it takes place on both ſides of the contract at once, or vibrates alternately from one to the other. This is what reſtrains prices to the adequate value of merchandiſe.

The great difficulty is to diſtinguiſh clearly between the principles of *demand* and thoſe of *competition*: here then follow the principal differences between the two relatively to the effects they produce ſeverally in the mercantile contract of buying and ſelling, which we here expreſs ſhortly by the word *contract*.

Simple demand is what brings the quantity of a commodity to market. Many demand, who do not buy; many offer, who do not ſell. This demand is called *great* or *ſmall*; it is ſaid to increaſe, to augment, to ſwell; and is expreſſed by theſe and other ſynonymous terms, which mark an augmentation or diminution of quantity. In this ſpecies, two people never demand the ſame thing, but a part of the ſame thing, or things quite alike.

Compound demand is the principle which raiſes prices, and can never make them ſink; becauſe in this caſe more than one demands the very ſame thing. It is ſolely applicable to the buyers, in relation to the price they offer. This demand is called *high* or *low*, and is ſaid to riſe, to fall, to mount, to ſink, and is expreſſed by theſe and other ſynonymous terms.

Simple competition, when between buyers, is the ſame as *compound* or *high demand*; but differs from it in ſo far, as this may equally take place among ſellers, which compound demand cannot; and then it works a contrary effect: it makes prices ſink, and is ſynonymous with low demand; it is this competition which overturns the balance of work and demand.

Double competition is what is underſtood to take place in almoſt every operation of trade; it is this which prevents their exceſſive riſe of prices; it is this which prevents their exceſſive fall. While double competition prevails, the balance is perfect, trade and induſtry flouriſh.

The capital diſtinction, therefore, between the terms *demand* and *competition* is, that *demand* is conſtantly relative to the buyers; and when money is not the price, as in barter, then it is relative to that ſide upon which the greateſt *competition* is found.

We therefore ſay, with regard to *prices*, demand is *high* or *low*. With regard *to the quantity of merchandiſe*, demand is *great* or *ſmall*. With regard to *competition*, it is always called *great* or *ſmall*, *ſtrong* or *weak*.

Competition is, with equal propriety, applicable to both parties in the contract. A *competition* among buyers is a proper expreſſion; a *competition* among ſellers, who have the merchandiſe, is fully as eaſily underſtood, though it be not quite ſo ſtriking, for reaſons which an example will make plain.

You come to a fair, where you find a great variety of every kind of merchandiſe, in the poſſeſſion of different merchants. Theſe by offering their goods to ſale, conſtitute a tacit competition; every one of them wiſhes to ſell in preference to another, and at the ſame time with the beſt advantage to himſelf.

The buyer begins, by cheapening at every ſhop. The firſt price aſked marks the covetouſneſs of the ſeller; the firſt price offered, the avarice of the buyer. From this operation competition begins to work its effects on both ſides, and ſo becomes double. The principles which influence this operation are now to be deduced.

It is impoſſible to ſuppoſe the ſame degree of eagerneſs, either to buy or ſell, among ſeveral merchants; becauſe the degree of eagerneſs is exactly in proportion to their views of profit; and as theſe muſt neceſſarily be influenced and regulated by different circumſtances, that buyer, who has the beſt proſpect of ſelling again with profit, obliges him, whoſe proſpect is not ſo good, to content himſelf with leſs; and that ſeller, who has bought to the beſt advantage, obliges him, who has paid dearer for the merchandiſe, to moderate his deſire of gain.

It is from theſe principles that competition among buyers and ſellers muſt originate. This is what confines the fluctuation of prices within limits which are compatible with the reaſonable profits of both buyers and ſellers; for we muſt conſtantly ſuppoſe the whole operation of buying and ſelling to be performed by merchants; the buyer cannot be ſuppoſed to give ſo high a price as that which he expects to receive when he diſtributes to the conſumers, nor can the ſeller be ſuppoſed to accept of a lower than that which he paid to the manufacturer. This competition is properly called *double*, becauſe of the difficulty to determine upon which ſide it ſtands; the ſame merchant may have it in his favour upon certain articles, and againſt him upon others; it is continually in vibration, and the arrival of every poſt may leſs or more pull down the heavy ſcale.

In every tranſaction between merchants, the profit reſulting from the ſale muſt be exactly diſtinguiſhed from the value of the merchandiſe. The firſt may vary, the laſt never can. It is this profit alone which can be influenced by competition; and it is for that reaſon we find ſuch uniformity everywhere in the prices of goods of the ſame quality.

The competition between ſellers does not appear ſo ſtriking as that between buyers; becauſe he who offers to ſale, appears only paſſive in the firſt operation; whereas the buyers preſent themſelves one after another; they make a demand when the merchandiſe is refuſed to one at a certain price; a ſecond either offers more, or does not offer at all; but ſo ſoon as another ſeller finds his account in accepting the price the firſt had refuſed, then the firſt enters into competition, providing his profits will admit his lowering the firſt price; and thus competition takes place among the ſellers, until the profits upon their trade prevent prices from falling lower.

In all markets this competition is varying, though inſenſibly, on many occaſions; but in others the vibrations are very perceptible. Sometimes it is found ſtrongeſt on the ſide of the buyers; and in proportion as this grows, the competition between the ſellers diminiſhes. When the competition between the former has raiſed prices to a certain ſtandard, it comes to a ſtop; then the competition changes ſides, and takes place among the ſellers, eager to profit by the higheſt price. This makes prices fall; and according as they fall, the competition among the buyers diminiſhes. They ſtill wait for the loweſt period. At laſt it comes, and then perhaps ſome new circumſtance, by giving the balance a kick, diſappoints their hopes. If therefore it ever happens, that there is but one intereſt upon one ſide of the contract, as in the example in the former ſection, where we ſuppoſed the ſellers united, you perceive, that the riſe of the price, occaſioned by the competition of the buyers, and even its coming to a ſtop, could not poſſibly have the effect of producing any competition on the other ſide; and therefore, if prices come afterwards to ſink, the fall muſt have proceeded from the prudential conſiderations of adapting the price to the faculties of thoſe who, from the height of it, had withdrawn their demand.

From theſe principles of competition, the foreſtalling of markets is made a crime, becauſe it diminiſhes the competition which ought to take place between different people, who have the ſame merchandiſe to offer to ſale. The foreſtaller buys all up, with an intention to ſell with more profit, as he has by that means taken other competitors out of his way, and appears with a ſingle intereſt on one ſide of the contract, in the face of many competitors on the other. This perſon is puniſhed by the ſtate, becauſe he has prevented the price of the merchandiſe from becoming juſtly proportioned to the real value; he has robbed the public and enriched himſelf; and in the puniſhment he makes reſtitution. Here occur two queſtions to be reſolved, for the ſake of illuſtration.

Can competition among buyers poſſibly take place, when the proviſion made is more than ſufficient to ſupply the quantity demanded? On the other hand, can competition take place among the ſellers, when the quantity demanded exceeds the total proviſion made for it?

We think it may in both caſes; becauſe in the one and the other, there is a competition implied on one ſide of the contract, and the very nature of this competition preſuppoſes a poſſibility of its coming on the other, provided ſeparate intereſts be found upon both ſides. But to be more particular:

1. Experience ſhows, that however juſtly the proportion between the demand and the ſupply may be determined in fact, it is ſtill next to impoſſible to diſcover it exactly, and therefore the buyers can only regulate the prices they offer, by what they may reaſon-

ably expect to ſell for gain. The ſellers, on the other hand, can only regulate the prices they expect, by what the merchandiſe has coſt them when brought to market. We have already ſhown, how, under ſuch circumſtances, the ſeveral intereſts of individuals affect each other, and make the balance vibrate.

2. The proportion between the ſupply and the demand is ſeldom other than *relative* among merchants, who are ſuppoſed to buy and ſell, not from neceſſity, but from a view to profit. What we mean by *relative* is, that their demand is *great* or *ſmall* according to prices; there may be a great demand for grain at 35s. per quarter, and no demand at all for it at 40s; that is, among merchants.

It is eſſential to attend to the ſmalleſt circumſtance in matters of this kind. The circumſtance we mean, is the difference we find in the effect of competition, when it takes place purely among merchants on both ſides of the contract, and when it happens, that either the conſumers mingle themſelves with the merchant-buyers, or the manufacturers, that is, the furniſhers, mingle themſelves with the merchant-ſellers. This combination we ſhall illuſtrate by the ſolution of another queſtion, and then conclude with a few reflections upon the whole.

Can there be no caſe formed where the competition upon one ſide may ſubſiſt, without a poſſibility of its taking place on the other, although there ſhould be ſeparate intereſts upon both?

The caſe is hardly ſuppoſable among merchants, who buy and ſell with a view to profit; but it is abſolutely ſuppoſable, and that is all, when the direct conſumers, are the buyers; when the circumſtances of one of the parties is perfectly known; and when the competition is ſo ſtrong upon one ſide, as to prevent a poſſibility of its becoming double, before the whole proviſion is ſold off, or the demand ſatisfied. Let us have recourſe to examples.

Grain arriving in a ſmall quantity, at a port where the inhabitants are ſtarving, producing ſo great a competition among the conſumers who are the buyers, that their neceſſity becomes evident; all the grain is generally bought up before prices can riſe ſo high as to come to a ſtop; becauſe nothing but want of money, that is, an impoſſibility of complying with the prices demanded by the merchants can reſtrain them: but if you ſuppoſe, even here, that prices come naturally to a ſtop; or that, after ſome time, they fall lower, from prudential conſiderations; then there is a poſſibility of a competition taking place among the ſellers, from the principles above deduced. If, on the contrary, the ſtop is not natural, but occaſioned by the interpoſition of the magiſtrate, from humanity, or the like, there will be no competition, becauſe then the principles of commerce are ſuſpended; the ſellers are reſtrained on one ſide, and they reſtrain the buyers on the other. Or rather indeed, it is the magiſtrate, or compaſſion, who in a manner fixes the price, and performs the office of both buyer and ſeller.

A better example ſtill may be found, in a competition among ſellers, where it may be ſo ſtrong as to render a commodity in a manner of no value at all, as in the caſe of an uncommon and unexpected draught of fiſh, in a place of ſmall conſumption, when no preparations have been made for ſalting them. There can be then no competition among the buyers, becauſe the market cannot laſt, and they find themſelves entirely maſters, to give what price they pleaſe, being ſure the ſellers muſt accept of it, or loſe their merchandiſe. In the firſt example, humanity commonly ſtops the activity of the principle of competition; in the other, it is ſtopped by a certain degree of fair dealing, which forbids the accepting of a merchandiſe for nothing.

In proportion therefore as the riſing of prices can ſtop demand, or the ſinking of prices can increaſe it, in the ſame proportion will competition prevent either the riſe or the fall from being carried beyond a certain length; and if ſuch a caſe can be put, where the riſing of prices cannot ſtop demand, nor the lowering of prices augment it, in ſuch caſes double competition has no effect; becauſe theſe circumſtances unite the moſt ſeparate intereſts of buyers and ſellers in the mercantile contract; and when upon one ſide there is no ſeparate intereſt, there can then be no competition.

From what has been ſaid, we may form a judgment of the various degree of competition. A book not worth a ſhilling, a fiſh of a few pounds weight, are often ſold for conſiderable ſums. The buyers here are not merchants. When an ambaſſador leaves a court in a hurry, things are ſold for leſs than the half of their value; he is no merchant, and his ſituation is known. When, at a public market, there are found conſumers, who make their proviſion, or manufacturers, who diſpoſe of their goods for preſent ſubſiſtence; the merchants, who are reſpectively upon the oppoſite ſide of the contract to theſe, profit of their competition; and thoſe who are reſpectively upon the ſame ſide with them, ſtand by with patience until they have finiſhed their buſineſs. Then matters come to be carried on between merchant and merchant, and then profits may riſe and fall in the proportion of quantity to demand; that is to ſay, if the proviſion is leſs than the demand, the competition among the demanders, or the riſe of the price, will be in the compound proportion of the falling ſhort of the commodity, and of the proſpect of ſelling again with profit. It is this combination which regulates the competition, and keeps it within bounds. It can affect but the profits upon the tranſaction; the intrinſic value of the commodity ſtands immoveable; nothing is ever ſold below the real value; nothing is ever bought for more than it may probably bring. We mean in general. Whereas, ſo ſoon as conſumers and needy manufacturers mingle in the operation, all proportion is loſt. The competition between them is too ſtrong for the merchants; the balance vibrates by jerks. In ſuch markets merchants ſeldom appear; the principal objects there, are the fruits and productions of the earth, and articles of the firſt neceſſity for life, not manufactures ſtrictly ſo called. A poor fellow often ſells to purchaſe bread to eat; not to pay what he did eat while he was employed in the work he diſpoſes of. The conſumer often meaſures the value of what he is about to purchaſe, by the weight of his purſe, and his deſire to conſume.

§ 6. *Of what is called Expence, Profit, and Loſs.*

The term *expence*, when ſimply expreſſed, without any particular relation, is always underſtood to be relative to money. This kind is diſtinguiſhed under the three heads of *private, public*, and *national.*

1. *Private expence* is what a private perſon, or private ſociety, lays out, either to provide articles of conſumption, or ſomething more permanent, which may be conducive to their eaſe, convenience, or advantage.

Thus we ſay, *a large domeſtic expence*, relative to one who ſpends a great income. We ſay, a merchant has been at *great expence* for magazines, for living, for clerks, &c. but never that he has been at any in buying goods. In the ſame way a manufacturer may expend for building, machines, horſes, and carriages, but never for the matter he manufactures. When a thing is bought in order to be ſold again, the ſum employed is called money *advanced;* when it is bought not to be ſold, it may be ſaid to be *expended.*

2. *Public expence* is the employment of that money which has been contributed by individuals for the current ſervice of the ſtate. The contribution, or gathering it together, repreſents the effects of many articles of *private expence;* the laying it out when collected is *public expence.*

3. *National expence* is what is expended out of the country; this is what diminiſhes national wealth. The principal diſtinction to be here attended to is between public expence, or the laying out of public money, and national expence, which is the alienating the nation's wealth in favour of ſtrangers. Thus the greateſt public expence imaginable may be no national expence; becauſe the money may remain at home. On the other hand, the ſmalleſt public, or even private expence, may be a national expence; becauſe the money may go abroad.

Profit and *loſs* is divided into *poſitive, relative*, and *compound. Poſitive profit* implies no loſs to any body; it reſults from an augmentation of labour, induſtry, or ingenuity, and has the effect of ſwelling or augmenting the public good.

Poſitive loſs implies no profit to any body; it is what reſults from the ceſſation of the former, or of the effects reſulting from it, and may be ſaid to diminiſh the public good.

Relative profit is what implies a loſs to ſomebody; it marks a vibration of the balance of wealth between parties, but implies no addition to the general ſtock.

Relative loſs is what, on the contrary, implies a profit to ſomebody; it alſo marks a vibration of the balance, but takes nothing from the general ſtock.

The *compound* is eaſily underſtood; it is that ſpecies of profit and loſs which is partly relative and partly poſitive.

§ 7. *The general conſequences reſulting to a trading Nation, upon the opening of an active foreign Commerce.*

A nation which remains paſſive in her commerce is at the mercy of thoſe who are active, and muſt be greatly favoured indeed by natural advantages, or by a conſtant flux of gold and ſilver from her mines, to be able to ſupport a correſpondence not entirely hurtful to the augmentation of her wealth.

When we look upon the wide field which here opens to our view, we are perplexed with too great a variety of objects. In one part, we ſee a decent and comely beginning of induſtry; wealth flowing gently in to recompenſe ingenuity; numbers both augmenting, and every one becoming daily more uſeful to another; agriculture proportionally extending itſelf; no violent revolutions; no exorbitant profits; no inſolence among the rich; no exceſſive miſery among the poor; multitudes employed in producing; great economy upon conſumption; and all the inſtruments of luxury, daily produced by the hands of the diligent, going out of the country for the ſervice of ſtrangers; not remaining at home for the gratification of ſenſuality. At laſt the augmentations come inſenſibly to a ſtop. Then theſe rivers of wealth, which were in briſk circulation through the whole world, and which returned to this trading nation as blood returns to the heart, only to be thrown out again by new pulſations, begin to be obſtructed in their courſe; and flowing abroad more ſlowly than before, come to form ſtagnations at home. Theſe, impatient of reſtraint, ſoon burſt out into domeſtic circulation. Upon this cities ſwell in magnificence of buildings; the face of the country is adorned with palaces, and becomes covered with groves; luxury ſhines triumphant in every part; inequality becomes more ſtriking to the eye; and want and miſery appear more deformed from the contraſt; even fortune grows more whimſical in her inconſtancy; the beggar of the other day now rides in his coach; and he who was born in a bed of ſtate, is ſeen to die in a gaol, or in an alms-houſe. Such are the effects of great domeſtic circulation.

The ſtateſman looks about with amazement; he who was wont to conſider himſelf as the firſt man in the ſociety in every reſpect, perceives himſelf, perhaps, eclipſed by the luſtre of private wealth, which avoids his graſp when he attempts to ſeize it. This makes his government more complex and more difficult to be carried on; he muſt now avail himſelf of art and addreſs, as well as of power and force. By the help of cajoling and intrigues he gets a little into debt; this lays a foundation for public credit, which, growing by degrees, and in its progreſs aſſuming many new forms, becomes, from the moſt tender beginnings, a moſt formidable monſter, ſtriking terror into thoſe who cheriſhed it in its infancy. Upon this, as upon a triumphant war-horſe, the ſtateſman gets aſtride; he then appears formidable anew; his head turns giddy; he is choaked with the duſt he has raiſed; and at the moment he is ready to fall, to his utter aſtoniſhment and ſurpriſe, he finds a ſtrong monied intereſt of his own creating, which, inſtead of ſwallowing him up, as he apprehended, flies to his ſupport. Through this he gets the better of all oppoſition, he eſtabliſhes taxes, multiplies them, mortgages his fund of ſubſiſtence; either becomes a bankrupt, and riſes again from his aſhes; or if he be leſs audacious, he ſtands trembling and tottering for a while on the brink of the political precipice. From the one or the other of theſe perilous ſituations, he begins to diſcover an endleſs path, which after a multitude of windings, ſtill returns into itſelf, and continues an equal courſe through this vaſt labyrinth.

It is now full time to leave off rhapſody, and return to reaſoning and cool inquiry, concerning the more immediate and more general effects and revolutions produced by the opening of a foreign trade in a nation of induſtry.

The firſt and moſt ſenſible alteration will be an increaſe of demand for manufacturers, becauſe by ſupplying the wants of ſtrangers, the number of conſumers will now be conſiderably augmented. What again will follow upon this, muſt depend upon circumſtances.

If this revolution in the ſtate of demand ſhould prove too violent, the conſequence of it will be to raiſe demand; if it ſhould prove gradual, it will increaſe it. This diſtinction is well underſtood, and the conſequence appears juſt; for, if the ſupply do not increaſe in proportion to the demand, a competition will enſue among the demanders; which is the common effect of ſuch ſudden revolutions. If, on the other hand, a gentle increaſe of demand ſhould be accompanied with a proportional ſupply, the whole induſtrious ſociety will grow in vigour, and in wholeſome ſtature, without being ſenſible of any great advantage or inconveniency; the change of their circumſtances will even be imperceptible.

The immediate effects of the violent revolution will, in this example, be flattering to ſome and diſagreeable to others. Wealth will be found daily to augment, from the riſing of prices, in many branches of induſtry. This will encourage the induſtrious claſſes, and the idle conſumers at home will complain. We have already dwelt abundantly long upon the effect reſulting from this to the lower claſſes of the people, in providing them with a certain means of ſubſiſtence. Let us now examine in what reſpect even the higher claſſes will be made likewiſe to feel the good effects of this general change, although at firſt they may ſuffer a temporary inconvenience from it.

Farmers, as has been obſerved, will have a greater difficulty in finding ſervants, who, inſtead of labouring the ground, will chooſe to turn themſelves to manufactures. This we have conſidered in the light of purging the lands of ſuperfluous mouths; but every conſequence in this great chain of politics draws other conſequences after it; and as they follow one another, things put on different faces, which affect claſſes differently. The purging of the land is but one of the firſt; here follows another.

The deſertion of the hands employed in a trifling agriculture will at firſt, no doubt, embarraſs the farmers; but in a little time every thing becomes balanced in a trading nation, becauſe here every induſtrious man muſt advance in proſperity, in ſpite of all general combinations of circumſtances.

In the caſe before us, the relative profits upon farming muſt ſoon become greater than formerly, becauſe of this additional expence which muſt affect the whole claſs of farmers; conſequently, this additional expence, inſtead of turning out to be a loſs to either landlord or farmer, will, after ſome little time, turn out to the advantage of both, becauſe the produce of the ground, being indiſpenſably neceſſary to every body, muſt in every article increaſe in its value. Thus, in a ſhort time, accounts will be nearly balanced on all hands; that is to ſay, the ſame proportion of wealth will, *cæteris paribus*, continue the ſame among the induſtrious. We ſay among the induſtrious; for thoſe who are either idle, or even negligent, will be great loſers.

A proprietor of land, inattentive to the cauſes of his farmer's additional expence, may very imprudently ſuffer his rents to fall, inſtead of aſſiſting him on a proper occaſion, in order to make them afterwards riſe the higher.

Thoſe who live upon a determined income in money, and who are nowiſe employed in traffic, nor in any ſcheme of induſtry, will, by the augmentation of prices, be found in worſe circumſtances than before.

In a trading nation every man muſt turn his talents to account, or he will undoubtedly be left behind in this univerſal emulation, in which the moſt induſtrious, the moſt ingenious, and the moſt frugal, will conſtantly carry off the prize.

This conſideration ought to be a ſpur to every man. The richeſt men in a trading nation have no ſecurity againſt poverty; we mean proportional poverty; for though they diminiſh nothing of their income, yet, by not increaſing it in proportion to others, they loſe their rank in wealth, and from the firſt claſs in which they ſtood they will ſlide inſenſibly down to a lower.

Their is one conſequence of an additional beneficial trade, which raiſes demand and increaſes wealth; but if we ſuppoſe no proportional augmentation of ſupply, it will prove at beſt but an airy dream which laſts for a moment; and when the gilded ſcene is paſſed away, numberleſs are the inconveniences which are ſeen to follow.

We ſhall now point out the natural conſequences of this augmentation of wealth drawn from foreign nations, when the ſtateſman remains inattentive to increaſe the ſupply both of food and manufactures, in proportion to the augmentation of mouths, and of the demand for the produce of induſtry.

In ſuch a ſituation profits will daily ſwell, and every ſcheme for reducing them within the bounds of moderation, will be looked upon as a hurtful and unpopular meaſure: be it ſo; but let us examine the conſequences.

We have ſaid, that the riſe of demand for manufactures naturally increaſes the value of work: now, we muſt add, that under ſuch circumſtances, the augmentation of riches in a country, either not capable of improvement as to the ſoil, or where precautions have not been taken for facilitating a multiplication of inhabitants, by the importation of ſubſiſtence, will be productive of the moſt calamitous conſequences.

On one ſide, this wealth will effectually diminiſh the maſs of the food before produced; and on the other, will increaſe the number of uſeleſs conſumers. The firſt of theſe circumſtances will raiſe the demand for food; and the ſecond will diminiſh the number of uſeful free hands, and conſequently raiſe the price of manufactures: here are ſhortly the outlines of this progreſs.

The more rich and luxurious a people are, the more delicate they become in their manner of living; if they fed on bread formerly, they will now feed on meat; if they fed on meat, they will now feed on fowl. The ſame ground which feeds a hundred with bread, and a proportional quantity of animal-food, will not maintain an equal number of delicate livers.

Food muſt then become more ſcarce; demand for it riſes; the rich are always the ſtrongeſt in the market; they conſume the food, and the poor are forced to ſtarve. Here the wide door to modern diſtreſs opens; to wit, a hurtful competition for ſubſiſtence. Farther, when a people become rich, they think leſs of economy; a number of uſeleſs ſervants are hired, to become an additional dead weight on conſumption; and when their ſtarving countrymen cannot ſupply the extravagance of the rich ſo cheaply as other nations, they either import inſtruments of foreign luxury, or ſeek to enjoy them out of their own country, and thereby make reſtitution of their gains.

Is it not therefore evident, that if, before things come to this paſs, additional ſubſiſtence be not provided by one method or other, the number of inhabitants muſt diminiſh; although riches may daily increaſe by a balance of additional matter ſuppoſed to be brought into the country in conſequence of the hitherto beneficial foreign trade? This is not all. We ſay further, that the beneficial trade will laſt for a time only. For the infallible conſequences of the riſe of prices at home will be, that thoſe nations which at firſt conſumed your manufactures, perceiving the gradual increaſe of their price, will begin to work for themſelves; or finding out your rivals who can ſupply them cheaper, will open their doors to them. Theſe again, perceiving the great advantages gained by your traders, will begin to ſupply the market; and ſince every thing muſt be cheaper in countries where we do not ſuppoſe the concurrence of all the circumſtances mentioned above, theſe nations will ſupplant you, and be enriched in their turn.

Here comes a new revolution. Trade is at a ſtand: what then becomes of all the hands which were formerly employed in ſupplying the foreign demands?

Were revolutions ſo ſudden as we are obliged to repreſent them, all would go to wreck; in proportion as they happen by quicker or ſlower degrees, the inconveniences are greater or ſmaller.

Prices, we have ſaid, are made to riſe by competition. If the competition of the ſtrangers was what raiſed them, the diſtreſs upon the manufacturers will be in proportion to the ſuddenneſs of their deſerting the market. If the competition was divided between the ſtrangers and the home-conſumers, the inconveniences which enſue will be leſs; becauſe the deſertion of the ſtrangers will be in ſome meaſure made up by an increaſe of home-conſumption which will follow upon the fall of prices. And if, in the third caſe, the natives have been ſo imprudent, as not only to ſupport a competition with the ſtrangers, and thereby diſguſt them from coming any more to market, but even to continue the competition between themſelves, the whole loſs ſuſtained by the revolution will be national. Wealth will ceaſe to augment; but the inconveniences, in place of being felt by the manufacturers, will only affect the ſtate; theſe will continue in affluence, extolling the generoſity of their countrymen, and deſpiſing the poverty of the ſtrangers who had enriched them.

Domeſtic luxury will here prove an expedient for preſerving from ruin the induſtrious part of a people, who in ſubſiſting themſelves had enriched their country. No change will follow in their condition; they will go on with a painful aſſiduity to labour; and if the conſequences of it become now hurtful to one part of the ſtate, they muſt at leaſt be allowed to be eſſentially neceſſary for the ſupport of another.

But that luxury is no neceſſary concomitant of foreign trade, in a nation where the true principles of it are underſtood, will appear very plain, from a contraſt we are now going to point out, in the example of a modern ſtate, renowned for its commerce and frugality. The country is Holland.

A ſet of induſtrious and frugal people were aſſembled in a country by nature ſubject to many inconveniences, the removing of which neceſſarily employed abundance of hands. Their ſituation upon the continent, the power of their former maſters, and the ambition of their neighbours, obliged them to keep great bodies of troops. Theſe two articles added to the numbers of the community, without either enriching the ſtate by their labour exported, or producing food for themſelves or countrymen.

The ſcheme of a commonwealth was calculated to draw together the induſtrious; but it has been ſtill more uſeful in ſubſiſting them: the republican form of government being there greatly ſubdivided, veſts authority ſufficient in every part of it, to make ſuitable proviſion for their own ſubſiſtence; and the tie which unites them, regards only matters of public concern. Had the whole been governed by one ſovereign, or by one council, this important matter never could have been effected.

It would be impoſſible for the moſt able miniſter that ever lived, to provide nouriſhment for a country ſo extended as France, or even as England, ſuppoſing theſe as fully peopled as Holland is; even although it ſhould be admitted that a ſufficient quantity of food might be found in other countries for their ſubſiſtence. The enterpriſe would be too great, abuſes would multiply; the conſequence would be, that the inhabitants would die for want. But in Holland, the caſe is different: every little town takes care of its own inhabitants; and this care being the object of application and profit to ſo many perſons, is accompliſhed with ſucceſs.

When once it is laid down as a maxim in a country, that food muſt of neceſſity be got from abroad in order to feed the inhabitants at home, the corn-trade becomes conſiderable, and at the ſame time certain, regular, and permanent. This was the caſe in Holland: as the inhabitants were induſtrious, the neceſſary conſequence has been, a very extraordinary multiplication; and at the ſame time ſuch an abundance of grain, that, inſtead of being in want themſelves, they often ſupply their neighbours. There are many examples of England's being ſupplied with grain from thence; and, which is ſtill more extraordinary, from the re-exportation of the very produce of its own fruitful ſoil.

It is therefore evident, that the only way to ſupport induſtry, is to provide a ſupply of ſubſiſtence, conſtantly proportional to the demand that may be made for it. This is a precaution indiſpenſably neceſſary for preventing hurtful competition. This is the particular care of the Dutch: ſo long as it can be effectual, their ſtate can fear no decline; but whenever they come to be diſtreſſed in the markets, upon which they depend for ſubſiſtence, they will ſink into ruin. It is by mere dint of frugality, cheap and parſimonious living, that the navigation of this induſtrious people is ſupported. Conſtant employment, and an accumulation of almoſt imperceptible gains, fill their coffers with wealth, in ſpite of the large outgoings, to which their own proper nouriſhment yearly forces them. The large profits upon induſtry in other countries, which are no proof of generoſity, but a fatal effect of a ſcanty ſubſiſtence, is far from dazzling their eyes. They ſeldom are found in the liſt of competitors at any foreign port; if they have their cargo to diſpoſe of, they wait with pleaſure in their own veſſels, conſuming their own proviſions, and at laſt accept of what others have left. It may be ſaid, that many other circumſtances concur in favour of the Dutch, beſides the article of ſubſiſtence. Without diſputing this matter, it may be obſerved, that if a computation be made of the hands employed in providing ſubſiſtence, and of thoſe who are ſeverally taken up in ſupplying every other want, their numbers will be found nearly to balance one another in the moſt luxurious countries. From this we may conclude, that the article of food, among the lower claſſes, muſt bear a very high proportion to all the other articles of their conſumption; and therefore a diminution upon the price of ſubſiſtence, muſt be of infinite conſequence to manufacturers who are obliged to buy it. From this conſideration, let us judge of the conſequence of ſuch augmentations upon the price of grain as are familiar to us; 30 or 40 per cent. ſeems nothing. Now this augmentation operates upon two-thirds, at leaſt, of the whole expence of a labouring man: let any one who lives in tolerable affluence make the application of this to himſelf, and examine how he would manage his affairs, if, by accidents of rains or winds, his expences were to riſe 30 per cent. without a poſſibility of reſtraining them; for this is unfortunately the caſe with all the lower claſſes. From whence it may be concluded, that the keeping food cheap, and ſtill more the preſerving it at all times at an equal ſtandard, is the fountain of the wealth of Holland; and that any hurtful competition in this article muſt beget a diſorder which will affect the whole of the manufacturers of a ſtate.

COMMERCY, a handſome town of France in the duchy of Bar, with the title of a principality, and a magnificent caſtle. It is ſeated on the river Meuſe, in E. Long. 5. 24. N. Lat. 48. 20.

COMMERSONIA. See Botany *Index*.

COMMINATION, an office in the liturgy of the church of England, appointed to be read on Aſh-Wedneſday, or the firſt day of Lent. It is ſubſtituted in the room of that *godly diſcipline in the primitive church*, by which (as the introduction to the office expreſſes it), "ſuch perſons, as ſtood convicted of notorious ſins, were put to open penance, and puniſhed in this world, that their ſouls might be ſaved in the day of the Lord; and that others, admoniſhed by their example, might be the more affraid to offend." This diſcipline, in after ages, degenerated, in the church of Rome, into a formal confeſſion of ſins upon Aſh Wedneſday, and the empty ceremony of ſprinkling aſhes upon the heads of the people. Our reformers wiſely rejected this ceremony, as mere ſhadow and ſhow; and ſubſtituted this office in its room, which is *A denunciation of God's anger and judgment againſt ſinners*, that the people, being appriſed of God's wrath and indignation againſt ſin, may not, through want of diſcipline in the church, be encouraged to follow and purſue them; but rather be moved to ſupply that diſcipline to themſelves, and ſo as to avoid being judged and condemned at the tribunal of God.

COMMINATORY, an appellation given to whatever threatens puniſhment, or ſome penalty. Thus, in France, when an exile is enjoined not to return under pain of death, it is deemed a *comminatory* penalty; ſince, if he do return, it is not ſtrictly executed; but a ſecond injunction is laid on him, which is more than comminatory, and, from the day of the date thereof, imports death without remedy.

COMMINGES, a province of France, 45 miles in length, and 15 in breadth; bounded on the north by Gaſcony, on the ſouth by Catalonia, on the eaſt by Couſſerans, and on the weſt by Bigorre. Its principal trade conſiſts in cattle, mules, and corn. St Bertrand is the capital town.

COMMINUTION, denotes the breaking, or rather grinding, a body to very ſmall particles.

COMMIRE, John, a celebrated Latin poet, born at Amboiſe in 1625, entered into the ſociety of the Jeſuits, and taught polite literature and divinity. He died at Paris in 1702. We have a volume of his Latin Poems, and a collection of his poſthumous works. His odes and fables are more particularly admired.

COMMISSARY, in the eccleſiaſtical law, an officer of the biſhop, who exerciſes ſpiritual juriſdiction in places of a dioceſe ſo far from the epiſcopal ſee, that the chancellor cannot call the people to the biſhop's principal conſiſtory court, without giving them too much inconveniency.

Commissary-Court, in Scotland, a court originally conſtituted by the biſhops for executing in their name an uſurped juriſdiction; and was anciently called the *biſhop's court*, *curia Chriſtianitatis*, or *conſiſtorial court*. This court was modelled by Queen Mary at the Reformation, and continues to this day.

Commissary, in a military ſenſe, is of different ſorts.

Commissary-General of the Muſters, an officer appointed to muſter the army, as often as the general thinks proper, in order to know the ſtrength of each regiment and company, to receive and inſpect the muſter-rolls, and to keep an exact ſtate of the ſtrength of the army.

COMMISSARY *of Horſes*, an officer in the artillery, appointed to have the inſpection of the artillery-horſes, to ſee them muſtered, and to ſend ſuch orders as he receives from the commanding officer of the artillery, by ſome of the conductors of horſes, of which he has a certain number for his aſſiſtants.

COMMISSARY *of Proviſions*, an officer who has the charge of furniſhing the army with proviſions.

COMMISSARY *of Stores*, an officer in the artillery who has the charge of all the ſtores, for which he is accountable to the office of ordnance.

COMMISSION, in common law, the warrant or letters patent, which all perſons exerciſing juriſdiction have to empower them to hear or determine any cauſe or ſuit; as the commiſſion of the judges, &c.

COMMISSION *of Bankruptcy*, is the commiſſion that iſſues from the lord chancellor on a perſon's becoming a bankrupt within any of the ſtatutes, directed to certain commiſſioners appointed to examine into it, and to ſecure the bankrupt's lands and effects for the ſatisfaction of his creditors. See the article BANKRUPT.

The proceedings on a commiſſion of bankruptcy may be divided, 1. Into thoſe which affect the bankrupt himſelf. 2. Into thoſe which affect his property.

Blackſt. Comment.

1. As to thoſe of the former kind, there muſt, in the firſt place, be a petition to the lord chancellor by one creditor to the amount of 100l. or by two to the amount of 150l. or by three or more to the amount of 200l.; upon which he grants a commiſſion to ſuch diſcreet perſons as to him ſhall ſeem good, who are then ſtyled commiſſioners of bankrupt. The petitioners, to prevent malicious applications, muſt be bound in a ſecurity of 200l. to make the party amends, in caſe they do not prove him a bankrupt, And if, on the other hand, they receive any money or effects from the bankrupt, as a recompenſe for ſuing out the commiſſion, ſo as to receive more than their rateable dividends of the bankrupt's eſtate, they forfeit not only what they ſhall have ſo received, but their whole debt. When the commiſſion is awarded and iſſued, the commiſſioners are to meet at their own expence, and to take an oath for the due execution of their commiſſion, and to be allowed a ſum not exceeding 20s *per diem* each, at every ſitting. And no commiſſion of bankruptcy ſhall abate or be void on any demiſe on the crown.

When the commiſſioners have received their commiſſion, they are firſt to receive proof of the perſon's being a trader, and having committed ſome act of bankruptcy; and then to declare him bankrupt, if proved ſo; and to give notice thereof in the gazette, and at the ſame time to appoint three meetings. At one of theſe meetings an election muſt be made of aſſignees, or perſons to whom the bankrupt's eſtate ſhall be aſſigned, and in whom it ſhall be veſted for the benefit of the creditors; which aſſignees are choſen by the major part, in value, of the creditors who ſhall then have proved their debts; but may be originally appointed by the commiſſioners, and afterwards approved or rejected by the creditors; but no creditors ſhall be admitted to vote in the choice of aſſignees, whoſe debt, on the balance of accounts, does not amount to 10l. And at the third meeting at fartheſt, which muſt be on the 42d day after the advertiſement in the gazette, the bankrupt, upon notice alſo perſonally ſerved upon him, or left at his uſual place of abode, muſt ſurrender himſelf perſonally to the commiſſioners, and muſt thenceforth in all reſpects conform to the directions of the ſtatutes of bankruptcy; or, in default thereof, ſhall be guilty of felony without benefit of clergy, and ſhall ſuffer death, and his goods and eſtate ſhall be divided among his creditors.

In caſe the bankrupt abſconds, or is likely to run away between the time of the commiſſion iſſued and the laſt day of ſurrender, he may, by warrant from any judge or juſtice of the peace, be apprehended and committed to the county gaol, in order to be forthcoming to the commiſſioners, who are alſo empowered immediately to grant a warrant for ſeizing his goods and papers.

When the bankrupt appears, the commiſſioners are to examine him touching all matters relating to his trade and effects. They may alſo ſummon before them, and examine, the bankrupt's wife, and any other perſon whatſoever, as to all matters relating to the bankrupt's affairs: And in caſe any of them ſhall refuſe to anſwer, or ſhall not anſwer fully, to any lawful queſtion, or ſhall refuſe to ſubſcribe ſuch their examination, the commiſſioners may commit them to priſon without bail, till they make and ſign a full anſwer; the commiſſioners ſpecifying in their warrant of commitment the queſtion ſo refuſed to be anſwered. And any gaoler, permitting ſuch perſon to eſcape or go out of priſon, ſhall forfeit 500l. to the creditors.

The bankrupt, upon this examination, is bound, upon pain of death, to make a full diſcovery of all his eſtate and effects, as well in expectancy as poſſeſſion, and how he has diſpoſed of the ſame; together with all books and writings relating thereto: and is to deliver up all in his power to the commiſſioners (except the neceſſary apparel of himſelf, his wife, and his children); or, in caſe he conceals or embezzles any effects to the amount of 20l. or withholds any book or writings, with intent to defraud his creditors, he ſhall be guilty of felony without benefit of clergy.

After the time allowed the bankrupt for ſuch diſcovery is expired, any other perſon voluntarily diſcovering any part of his eſtate before unknown to the aſſignees, ſhall be entitled to five per cent. out of the effects ſo diſcovered, and ſuch farther reward as the aſſignees and commiſſioners ſhall think proper. And any truſtee wilfully concealing the eſtate of any bankrupt, after the expiration of 42 days, ſhall forfeit 100l. and double the value of the eſtate concealed, to the creditors.

Hitherto every thing is in favour of the creditors; and the law ſeems to be pretty rigid and ſevere againſt the bankrupt; but, in caſe he proves honeſt, it makes him full amends for all this rigour and ſeverity. For, if the bankrupt hath made an ingenuous diſcovery, hath conformed to the directions of the law, and hath acted in all points to the ſatisfaction of his creditors; and if they, or four parts in five of them in number and value (but none of them creditors for leſs than

20l. will ſign a certificate to that purport; the commiſſioners are then to authenticate ſuch certificate under their hands and ſeals, and to tranſmit it to the lord chancellor: and he, or two judges whom he ſhall appoint, on oath made by the bankrupt that ſuch certificate was obtained without fraud, may allow the ſame; or diſallow it, upon cauſe ſhown by any of the creditors of the bankrupt.

If no cauſe be ſhown to the contrary, the certificate is allowed of courſe; and then the bankrupt is entitled to a decent and reaſonable allowance out of his effects, for his future ſupport and maintenance, and to put him in a way of honeſt induſtry. This allowance is alſo in proportion to his former good behaviour, in the early diſcovery of the decline of his affairs, and thereby giving his creditors a large dividend. For if his effects will not pay one half of his debts, or 10s. in the pound, he is left to the diſcretion of the commiſſioners and aſſignees, to have a competent ſum allowed him, not exceeding 3 per cent.; but if they pay 10s. in the pound, he is to be allowed 5 per cent.; if 12s 6d. then 7½ per cent; and if 15s. in the pound, then the bankrupt ſhall be allowed 10 per cent.; provided that ſuch allowance do not in the firſt caſe exceed 200l. in the ſecond 250l. and in the third 300l.

Beſides this allowance, he has alſo an indemnity granted him, of being free and diſcharged for ever from all debts owing by him at the time he became a bankrupt; even though judgment ſhall have been obtained againſt him, and he lies in priſon upon execution for ſuch debts; and, for that among other purpoſes, all proceedings on commiſſion of bankrupt, are, on petition, to be entered on record, as a perpetual bar againſt actions to be commenced upon this account: though, in general, the production of the certificate properly allowed ſhall be ſufficient evidence of all previous proceedings. Thus the bankrupt becomes a clear man again; and, by the aſſiſtance of his allowance and his own induſtry, may become an uſeful member of the commonwealth; which is the rather to be expected, as he cannot be entitled to theſe benefits, but by the teſtimony of his creditors themſelves of his honeſt and ingenuous diſpoſition; and unleſs his failures have been owing to misfortunes, rather than to miſconduct and extravagance.

2. As to the proceedings which affect the brnkrupt's property.

By virtue of the ſtatutes before mentioned, all the perſonal eſtate and effects of the bankrupt are conſidered as veſted, by the act of bankruptcy, in the future aſſignees of his commiſſioners, whether they be goods in actual poſſeſſion, or debts, contracts, and other choſes in action; and the commiſſioners by their warrant may cauſe any houſe or tenement of the brankrupt to be broken open, in order to enter upon and ſeize the ſame. And when the aſſignees are choſen or approved by the creditors, the commiſſioners are to aſſign every thing over to them; and the property of every part of the eſtate is thereby as fully veſted in them as it was in the bankrupt himſelf, and they have the ſame remedies to recover it.

The property veſted in the aſſignees is the whole that the bankrupt had in himſelf, at the time he committed the firſt act of bankruptcy, or that has been veſted in him ſince, before his debts are ſatiſfied or agreed for. Therefore it is uſually ſaid, that once a bankrupt, and always a bankrupt: by which is meant, that a plain direct act of bankruptcy once committed, cannot be purged, or explained away, by any ſubſequent conduct, as a dubious equivocal act may be; but that, if a commiſſion is afterward awarded, the commiſſion and the property of the aſſignees ſhall have a relation, or reference, back to the firſt and original act of bankruptcy. Inſomuch that all tranſactions of the bankrupt are from that time abſolutely null and void, either with regard to the alienation of his property, or the receipt of his debts from ſuch as are privy to his bankruptcy; for they are no longer his property, or his debts, but thoſe of the future aſſignees. And if an execution be ſued out, but not ſerved and executed on the bankrupt's effects till after the act of bankruptcy, it is void, as againſt the aſſignees. But the king is not bound by this fictitious relation, nor is within the ſtatutes of bankrupts; for if, after the act of bankruptcy committed, and before the aſſignment of his effects, an extent iſſues for the debt of the crown, the goods are bound thereby. In France this doctrine of relation is carried to a very great length: for there, every act of a merchant, for ten days precedent to the act of bankruptcy, is preſumed to be fraudulent, and is therefore void. But with us the law ſtands upon a more reaſonable footing; for as theſe acts of bankruptcy may ſometimes be ſecret to all but a few, and it would be prejudicial to trade to carry this notion to its utmoſt length, it is provided by ſtat. 19 Geo. II. c. 32. that no money paid by a bankrupt to a *bona fide*, or real creditor, in a courſe of trade, even after an act of bankruptcy done, ſhall be liable to be refunded. Nor by ſtat. 1 Jac. I. c. 15. ſhall any debtor of a bankrupt that pays him his debt without knowing of his bankruptcy, be liable to account for it again. The intention of this relative power being only to reach fraudulent tranſactions, and not to diſtreſs the fair trader.

The aſſignees may purſue any legal method of recovering this property ſo veſted in them by their own authority; but cannot commence a ſuit in equity, nor compound any debts owing to the bankrupt, nor refer any matters to arbitration, without the conſent of the creditors, or the major part of them in value, at a meeting to be held in purſuance of notice in the gazette.

When they have got in all the effects they can reaſonably hope for, and reduced them to ready money, the aſſignees muſt, within 12 months after the commiſſion iſſued, give 21 days notice to the creditors of a meeting for a dividend or diſtribution; at which time they muſt produce their accounts, and verify them upon oath, if required. And then the commiſſioners ſhall direct a dividend to be made, at ſo much in the pound, to all creditors who have before proved, or ſhall then prove, their debts. This dividend muſt be made equally, and in a rateable proportion, to all the creditors, according to the quantity of their debts; no regard being had to the quality of them. Mortgages, indeed, for which the creditor has a real ſecurity in his own hands, are entirely ſafe; for the commiſſion of bankrupt reaches only the equity of redemption. So are all perſonal debts, where the creditor has a chattel in his hands, or a pledge or pawn, for the payment, or has taken the debtor's lands or goods in execution. And, upon the equity of the ſtat. 8 An. c. 14. (which directs, that upon all executions of goods being on any premiſes demiſed to a tenant, one year's rent and no more ſhall, if due, be paid to the landlord) it hath alſo been held, that under a commiſſion of bankrupt, which is in the nature of a ſtatute execution, the landlord ſhall be allowed his arrears of rent to the ſame amount, in preference to other creditors, even though he hath neglected to diſtrain while the goods remained on the premiſes; which he is otherwiſe entitled to do for his entire rent, be the quantum what it may. But otherwiſe judgments and recognizes (both which are debts of record, and therefore at other times have a priority), and alſo bonds and obligations by deed or ſpecial inſtrument (which are called deeds by ſpecialty, and are uſually the next in order), theſe are all put on a level with debts by mere ſimple contract, and all paid *pari paſſu*. Nay, ſo far is this matter carried, that, by the expreſs proviſion of the ſtatutes, debts not due at the time of the dividend made, as bonds or notes of hand, payable at a future day, ſhall be paid equally with the reſt, allowing a diſcount or drawback in proportion. And inſurances, and obligations upon bottomry or reſpondentia, *bona fide*, made by the bankrupt, though forfeited after the commiſſion is awarded, ſhall be looked upon in the ſame light as debts contracted before any act of bankruptcy.

Within 18 months after the commiſſion iſſued, a ſecond and final dividend ſhall be made, unleſs all the effects were exhauſted by the firſt. And if any ſurplus remains, after paying every creditor his full debt, it ſhall be reſtored to the bankrupt. This is a caſe which ſometimes happens to men in trade, who involuntarily, or at leaſt unwarily, commit acts of bankruptcy, by abſconding and the like, while their effects are more than ſufficient to pay their creditors. And if any ſuſpicious or malevolent creditor will take the advantage of ſuch acts, and ſue out a commiſſion, the bankrupt has no remedy, but muſt quietly ſubmit to the effects of his own imprudence: except that upon ſatisfaction made to all the creditors, the commiſſion may be ſuperſeded. This caſe may alſo happen when a knave is deſirous of defrauding his creditors, and is compelled, by a commiſſion, to do them that juſtice which otherwiſe he wanted to evade. And therefore, though the uſual rule is, that all intereſt on debts carrying intereſt ſhall ceaſe from the time of iſſuing the commiſſion, yet in caſe of a ſurplus left after payment of every debt, ſuch intereſt ſhall again revive, and be chargeable on the bankrupt or his repreſentatives.

Commiſſion of LUNACY, iſſues out of the court of chancery, whether a perſon repreſented to be a lunatic, be ſo or not. See LUNACY.

COMMISSION of Teinds, a court at Edinburgh, which came in place of a committee of the Scottiſh parliament, for erecting new pariſhes, and valuing teinds for the ſupport of the clergy. It is veſted in the lords of ſeſſion. See LAW *Index*.

COMMISSION-officers. See OFFICERS.

COMMISSION, in *Commerce*, See FACTORAGE.

COMMISSIONER, a perſon authorized by commiſſion, letters patent, or other lawful warrant, to examine any matters, or execute any lawful commiſſion.

COMMISSIONER in the General Aſſembly of the church of Scotland. See ASSEMBLY (*General*).

COMMISSIONERS of the Cuſtoms. See CUSTOMS.

COMMISSIONERS of Exciſe. See EXCISE.

COMMISSIONERS of the Navy. See NAVY.

Lords COMMISSIONERS of the Treaſury. See TREASURY and EXCHEQUER.

COMMISSURE, a term uſed by ſome authors for the ſmall metuſes or interſtices of bodies; or the little clefts between the particles: eſpecially when thoſe particles are broadiſh and flat, and lie contiguous to one another, like thin plates and lamellæ. The word literally ſignifies *a joining* or connecting of one thing to another.

COMMISSURE, in *Architecture*, &c. denotes the joint of two ſtones, or the application of the ſurface of the one to that of the other. See MASONRY.

Among anatomiſts, commiſſure is ſometimes alſo uſed for a ſuture of the cranium or ſkull. See SUTURE.

COMMITMENT, in criminal law, is the ſending to priſon a perſon who hath been guilty of any crime. This takes place where the offence is not bailable, or the party cannot find BAIL; muſt be by proper warrant, containing the cauſe of the commitment; and continues till put an end to by the courſe of law (See TRIAL); impriſonment being intended only for ſafe cuſtody, and not for puniſhment (See ARRESTMENT and BAIL). In this dubious interval between the commitment and trial, a priſoner ought to be uſed with the utmoſt humanity; and neither be loaded with needleſs fetters, nor ſubjected to other hardſhips than ſuch as are abſolulely requiſite for the purpoſe of confinement only: though what are ſo requiſite muſt too often be left to the diſcretion of the gaolers, who are frequently a mercileſs race of men, and, by being converſant in ſcenes of miſery, ſteeled againſt any tender ſenſation.

COMMITTEE, one or more perſons to whom the conſideration or ordering of a matter is referred, either by ſome court, or by the conſent of parties to whom it belongs.

COMMITTEE of Parliament, a certain number of members appointed by the houſe for the examination of a bill, making a report of an inquiry, proceſs of the houſe, &c. See PARLIAMENT.

Sometimes the whole houſe is reſolved into a committee; on which occaſion each perſon has a right to ſpeak and reply as much and as often as he pleaſes: an expedient they uſually have recourſe to in extraordinary caſes, and where any thing is to be thoroughly canvaſſed. When the houſe is not in a committee, each gives his opinion regularly, and is only allowed to ſpeak once, unleſs to explain himſelf.

The ſtanding committees, appointed by every new parliament, are thoſe of privileges and elections, of religion, of grievances, of courts of juſtice, and of trade; though only the former act.

COMMIXTION, in Scots law, is a method of acquiring property, by mixing or blending together different ſubſtances belonging to different proprietors. See LAW *Index*.

COMMODATE, Commodatum, in the civil juriſprudence, the loan or free conceſſion of any thing moveable or immoveable, for a certain time, on condition of reſtoring again the ſame individual after a certain term. The commodate is a kind of loan; there is this difference, however, between a loan and a commodate, that the latter is gratis, and does not transfer the property: the thing muſt be returned in eſſence, and without impairment; ſo that things which conſume by uſe or time cannot be objects of a commodate, but of a loan; in regard they may be returned in kind, though not in identity. See Law *Index*.

COMMODIANUS, Gazeus, a Chriſtian author in the 4th century, who wrote a work in Latin verſe, entitled Inſtructions; the moral of which is excellent, but the verſe extremely heavy. M. Davies publiſhed a fine edition of it in 1711, at the end of Minucius Felix.

COMMODITY, in a general ſenſe, denotes all ſorts of wares and merchandiſes whatſoever that a perſon deals or trades in.

Staple Commodities, ſuch wares and merchandiſes as are commonly and readily ſold in a market, or exported abroad; being for the moſt part the proper produce or manufacture of the country.

COMMODORE, a general officer in the Britiſh marine, inveſted with the command of a detachment of ſhips of war deſtined on any particular enterpriſe, during which time he bears the rank of brigadier-general in the army, and is diſtinguiſhed from the inferior ſhips of his ſquadron by a broad red pendant tapering towards the outer end, and ſometimes forked. The word is corrupted from the Spaniſh *comendador*.

Commodore is alſo a name given to ſome ſelect ſhip in a fleet of merchantmen, who leads the van in time of war, and carries a light in his top to conduct the reſt and keep them together. He is always the oldeſt captain in the fleet he commands.

COMMODUS, L. Aurelius Antoninus, ſon of M. Antoninus, ſucceeded his father in the Roman empire. He was naturally cruel and fond of indulging his licentious propenſities. He wiſhed to be called Hercules; and like that hero, he adorned his ſhoulders with a lion's ſkin, and armed his hand with a knotted club. He publicly fought with the gladiators, and boaſted of his dexterity in killing the wild beaſts in the amphitheatre. He required divine honours from the ſenate, and they were granted. He was wont to put ſuch an immenſe quantity of gold duſt in his hair, that when he appeared bare-headed in the ſunſhine his head glittered as if ſurrounded with ſun-beams. Martia, one of his concubines, whoſe death he had prepared, poiſoned him: but as the poiſon did not quickly operate, he was ſtrangled by a wreſtler. He died in the 31ſt year of his age, and the 13th of his reign. It has been obſerved, that he never truſted himſelf to a barber; but always burnt his beard, in imitation of the tyrant Dionyſius. A. D. 192.

COMMON, Communis, ſomething that belongs to all alike; is owned or allowed by all; and not confined to this more than that. In this ſenſe, *common* ſtands oppoſed to *proper*, *peculiar*, &c. Thus, the earth is ſaid to be our *common* mother; in the firſt or golden age all things were in *common*, as well as the ſun and elements: the name animal is *common* to man and beaſt; that of ſubſtance to body and ſpirit.

Common, *Communia*, (i. e. *quod ad omnes pertinet*), in law, ſignifies that ſoil, the uſe whereof is common to a particular town or lordſhip; or it is a profit that a man hath in the land of another perſon, uſually in common with others; or a right which a perſon hath to put his cattle to paſture into ground that is not his own. And there is not only common of paſture, but alſo common of piſcary, common of eſtovers, common of turbary, &c. And in all caſes of common, the law much reſpects the cuſtom of the place; for there the rule is, *conſuetudo loci eſt obſervanda*. See Commonty.

Common Council. See Council.

Common Law, that body of law received as rules in parliament to alter the ſame. See Law, Part II. Nº 36.

Common-Place Book, is a regiſter of what things occur, worthy to be noted, in the courſe of a man's thinking or ſtudy, ſo diſpoſed as that among a number of ſubjects any one may be eaſily found. The advantages of making a common-place book are many; it not only makes a man read with accuracy and attention, but induces him inſenſibly to think for himſelf, provided he conſiders it not ſo much as a regiſter of ſentiments that ſtrike him in the courſe of reading, but as a regiſter of his own thoughts upon various ſubjects. Many valuable thoughts occur even to men of no extraordinary genius. Theſe, without the aſſiſtance of a common-place book, are generally loſt both to himſelf and others. There are various methods of arranging common-place books; that of Mr Locke is as good as any that have hitherto been contrived.

The firſt page of the book you intend to take down their common-place in, is to ſerve as a kind of index to the whole, and to contain references to every place or matter therein: in the commodious contrivance of which index, ſo as it may admit of a ſufficient copia or variety of materials, without any confuſion, all the ſecret of the method conſiſts.

In order to this, the firſt page, as already mentioned, or for more room, the two firſt pages that front each other, are to be divided by parallel lines into 25 equal parts; whereof every fifth line is to be diſtinguiſhed by its colour or other circumſtance. Theſe lines are to be cut perpendicularly by others, drawn from top to bottom: and in the ſeveral ſpaces thereof the ſeveral letters of the alphabet, both capital and minuſcle, are to be duly written.

The form of the lines and diviſions, both horizontal and perpendicular, with the manner of writing the letters therein, will be conceived from the following ſpecimen; wherein, what is to be done in the book for all the letters of the alphabet, is here ſhown in the firſt four, *A*, *B*, *C*, and *D*.

A	a		C	a	
	e			e	
	i			i	
	o			o	
	u			u	
B	a		D	a	
	e	2, 3.		e	
	i			i	
	o			o	
	u			u	

The index to the common-place book thus formed, matters are ready for the taking down any thing therein.

In order to this, conſider to what head the thing you would enter is moſt naturally referred; and under which one would be led to look for ſuch a thing; in this head, or word, regard is had to the initial letter, and the firſt vowel that follows it; which are the characteriſtic letters whereon all the uſe of the index depends.

Suppoſe (*e. gr.*) I would enter down a paſſage that refers to the head *beauty*. *B*, I conſider, is the initial letter, and *e* the firſt vowel: then, looking upon the index for the partition *B*, and therein the line *e* (which is the place for all words whoſe firſt letter is *b*, and firſt vowel *e*; as *beauty*, *beneficence*, *bread*, *breeding*, *blemiſhes*), and finding no numbers already down to direct me to any page of the book where words of this characteriſtic have been entered, I turn forward to the firſt blank page I find (which, in a freſh book, as this is ſuppoſed to be, will be page 2d), and here write what I have occaſion for on the head *beauty*; beginning the head in the margin, and indenting all the other ſubſervient lines, that the head may ſtand out, and ſhow itſelf; this done, I enter the page where it is written, viz. 2, in the index in the ſpace B*e*; from which time the claſs *be* becomes wholly in poſſeſſion of the 2d and 3d pages, which are conſigned to letters of this characteriſtic.

Had I found any page or number already entered in the ſpace *B e*, I muſt have turned to the page, and have written my matter in what room was left therein: ſo, if after entering the paſſage on beauty, I ſhould have occaſion for *benevolence*, or the like, finding the number 2 already poſſeſſed of the ſpace of this characteriſtic, I begin the paſſage on benevolence in the remainder of the page; which not containing the whole, I carry it on to page 3d, which is alſo for *be*; and add the number 3 in the index.

COMMON Pleas is one of the king's courts now held conſtantly in Weſtminſter-hall, but in former times was moveable.

All civil cauſes, as well real as perſonal, are, or were formerly, tried in this court, according to the ſtrict law of the land. In perſonal and mixed actions it has a concurrent juriſdiction with the king's bench, but has no cognizance of pleas of the crown. The actions belonging to the court of common-pleas come thither by original, as arreſts and outlawries; or by privilege, or attachment for or againſt privileged perſons; or out of inferior courts, not of record, by *pone*, *recordari*, *accedas ad curiam*, writ of falſe judgment, &c. The chief judge of this court is called *lord chief juſtice of the common pleas*, who is aſſiſted by three other judges. The other officers of the court are the *cuſtos brevium*, who is the chief clerk; three prothonotaries, and their ſecondaries; the clerk of the warrants, clerk of the eſſoins, 14 filazers, 4 exigentors, a clerk of the juries, the chirographer, the clerk of the king's ſilver, clerk of the treaſury, clerk of the ſeal, clerk of the outlawries, clerk of the inrolment of fines and recoveries, and clerk of the errors.

COMMON-Prayer is the liturgy in the church of England: (See LITURGY.) Clergymen are to uſe the public form of prayers preſcribed by the Book of Common Prayer: and refuſing to do ſo, or uſing any other public prayers, are puniſhable by ſtat. 1. Eliz. c. ii.

COMMON, in *Grammar*, denotes the gender of nouns which are equally applicable to both ſexes; thus, *parens* "a parent," is of the common gender.

COMMON, in *Geometry*, is applied to an angle, line, or the like, which belongs equally to two figures.

COMMON Diviſor, a quantity or number which exactly divides two or more other quantities or numbers, without leaving any remainder.

COMMONALTY, the lower of the two diviſions of the civil ſtate, See *CIVIL State*.

The commonalty, like the nobility, are divided into ſeveral degrees: and as the lords, though different in rank, yet all of them are peers in reſpect of their nobility; ſo the commoners, though ſome are greatly ſuperior to others, yet all are in law commonalty, in reſpect of their want of nobility.

1. The firſt name of dignity next beneath a peer was anciently that of *vidames*, *vice-domini*, or *valvaſors*: who are mentioned by our ancient lawyers as *viri magnæ dignitatis*; and Sir Edward Coke ſpeaks highly of them. Yet they are now quite out of uſe; and our legal antiquarians are not agreed upon even their original or ancient office.

2. Now, therefore, the firſt perſonal dignity after the nobility is a knight of the order of St George, or of the garter, firſt inſtituted by Edw. III. A. D. 1344.

3. Next (but not till after certain official dignities, as privy-counſellors, the chancellors of the exchequer and duchy of Lancaſter, the chief juſtice of the king's bench, the maſter of the rolls, and the other Engliſh judges), follows a *knight banneret*; who indeed, by ſtatutes 5 Richard II. ſtat. 2. c. 4. and 14 Richard II. c. 11. is ranked next after barons; and his precedence before the younger ſons of viſcounts was confirmed to him by order of King James I. in the tenth year of his

reign. But in order to entitle him to this rank, he muſt have been created by the king in perſon, in the field, under the royal banners, in time of open war; elſe he ranks after

4. *Baronets;* who are the next in order: which title is a dignity of inheritance, created by letters patent, and uſually deſcendible to the iſſue-male. See Baronets.

5. Next follow *knights of the Bath*. See Bath.

6. The laſt of theſe inferior nobility are *knights bachelors;* the moſt ancient, though the loweſt, order of knighthood amongſt us. See Bachelor.

7. The above, with thoſe enumerated under the article Nobility, Sir Edward Coke ſays, are all the names of *dignity* in this kingdom; *eſquires* and *gentlemen* being only names of *worſhip*. But before theſe laſt the heralds rank all colonels, ſergeants at law, and doctors in the three learned profeſſions.

8. *Eſquires* and *gentlemen* are confounded together by Sir Edward Coke: who obſerves, that every eſquire is a gentleman, and a gentleman is defined to be one *qui arma gerit*, "who bears coat-armour;" the grant of which adds gentility to a man's family: in like manner as civil nobility among the Romans was founded in the *jus imaginum*, or having the image of one anceſtor at leaſt who had borne ſome curule office. It is indeed a matter ſomewhat unſettled what conſtitutes the diſtinction, or who is a real eſquire; for it is not an eſtate, however large, that confers this rank upon its owner. Camden, who was himſelf a herald, diſtinguiſhes them the moſt accurately; and he reckons up four ſorts of them: 1ſt, The eldeſt ſons of knights, and their eldeſt ſons in perpetual ſucceſſion. 2dly, The eldeſt ſons of younger ſons of peers, and their eldeſt ſons, in like perpetual ſucceſſion: both which ſpecies of eſquires Sir Henry Spelman entitles *armigeri natalitii*. 3dly, Eſquires created by the king's letters patent, or other inveſtiture; and their eldeſt ſons. 4thly, Eſquires by virtue of their office: as juſtices of the peace and others who bear any office of truſt under the crown. To theſe may be added the eſquires of the knights of the bath, each of whom conſtitutes three at his inſtallation; and all foreign, nay, Iriſh peers; for not only theſe, but the eldeſt ſons of peers of Great Britain, though frequently titular lords, are only eſquires in the law, and muſt be ſo named in all legal proceedings.

9. As for *gentlemen*, ſays Sir Thomas Smith, they be made good cheap in this kingdom; for whoſoever ſtudieth the laws of the realm, who ſtudieth in the univerſities, who profeſſeth literal ſciences, and (to be ſhort) who can live idly and without manual labour, and will bear the part, charge, and countenance of a gentleman, he ſhall be called maſter, and ſhall be taken for a gentleman.

10. A *yeoman* is he that hath free land of 40s. by the year; who is thereby qualified to ſerve on juries, vote for knights of the ſhire, and do any other act where the law requires one that is *probus et legalis homo*.

11. The reſt of the commonalty are *tradeſmen*, *artificers*, and *labourers;* who (as well as all others) muſt, in purſuance of the ſtatute 1 Henry V. c. 5. be ſtyled by the name and addition of their eſtate, degree, or myſtery, in all actions and other legal proceedings.

COMMONER, or Gentleman-Commoner, in the univerſities, a ſtudent entered in a certain rank.

COMMONS, or House of Commons, a denomination given to the lower houſe of parliament. See Parliament.

The commons conſiſt of all ſuch men of any property in the kingdom as have not ſeats in the houſe of lords, every one of whom has a voice in parliament, either perſonally or by his repreſentatives. In a free ſtate, every man, who is ſuppoſed a free agent, ought to be in ſome meaſure his own governor; and therefore a branch at leaſt of the legiſlative power ſhould reſide in the whole body of the people. And this power, when the territories of the ſtate are ſmall and its citizens eaſily known, ſhould be exerciſed by the people in their aggregate or collective capacity, as was wiſely ordained in the petty republics of Greece, and the firſt rudiments of the Roman ſtate. But this will be highly inconvenient when the public territory is extended to any conſiderable degree, and the number of citizens is increaſed. Thus when, after the Social war, all the burghers of Italy were admitted free citizens of Rome, and each had a vote in the public aſſemblies, it became impoſſible to diſtinguiſh the ſpurious from the real voter, and from that time all elections and popular deliberations grew tumultuous and diſorderly; which paved the way for Marius and Sylla, Pompey and Cæſar, to trample on the liberties of their country, and at laſt to diſſolve the commonwealth. In ſo large a ſtate as ours, therefore, it is very wiſely contrived, that the people ſhould do that by their repreſentatives which it is impracticable to perform in perſon: repreſentatives choſen by a number of minute and ſeparate diſtricts, wherein all the voters are or may be eaſily diſtinguiſhed. The counties are therefore repreſented by knights, elected by the proprietors of lands; the cities and boroughs are repreſented by citizens and burgeſſes, choſen by the mercantile or ſuppoſed trading intereſt of the nation; much in the ſame manner as the burghers in the diet of Sweden are choſen by the corporate towns, Stockholm ſending four, as London does with us, other cities two, and ſome only one. The number of Engliſh repreſentatives is 513, of Scots 45; in all 558; and every member, though choſen by one particular diſtrict, when elected and returned, ſerves for the whole realm; for the end of his coming thither is not particular, but general; not barely to advantage his conſtituents, but the commonwealth; to adviſe his majeſty, as appears from the writ of ſummons, "de communi conſilio ſuper negotiis quibuſdam arduis et urgentibus, regem, ſtatum, et defenſionem regni Angliæ et eccleſiæ Anglicanæ concernentibus." And therefore he is not bound, like a deputy in the United Provinces, to conſult with, or take the advice of, his conſtituents upon any particular point, unleſs he himſelf thinks it proper or prudent ſo to do.

The peculiar laws and cuſtoms of the houſe of commons relate principally to the raiſing of taxes, and the elections of members to ſerve in parliament. See Taxes and Elections.

Doctors Commons. See *College of Civilians*.

Proctor of the Commons. See Proctor.

COMMONTY, in *Scots Law*, ſometimes ſignifies lands belonging to two or more common proprietors; ſometimes a heath or muir, though it ſhould belong in property to one, if there has been a promiſcuous poſſeſſion upon it by paſturage; and the act 1695 mentions commonties belonging in property to the king and to royal boroughs. See Law *Index*.

COMMONWEALTH. See Republic.

COMMOTE, an ancient term in Wales, denoting half a cantred, or hundred: containing 50 villages. See Hundred. Wales was anciently divided into three provinces; each of theſe ſubdivided into cantreds, and every cantred into two commotes or hundreds. Silveſter Girald, however, tells us in his itinerary, that a commote is but a quarter of a hundred.

COMMUNIS, in *Botany*, the name of a claſs in Linnæus's *Methodus Calycina*, conſiſting of two plants which, like teazel and dandelion, have a calyx or flower-cup common to many flowers or florets. Theſe are the aggregate or compound flowers of other ſyſtems.

COMMUNIBUS locis, a Latin term, in frequent uſe among philoſophical, &c. writers; implying ſome medium or mean relation, between ſeveral places. Dr Keil ſuppoſes the ocean to be one quarter of a mile deep, *communibus locis*, q. d. at a medium, or taking one place with another.

Communibus Annis, has the ſame import with regard to years that *communibus locis* has with regard to places. Mr Derham obſerves that the depth of rain, *communibus annis*, or one year with another, were it to ſtagnate on the earth, would amount in Townley in Lancaſhire, to 42½ inches; at Upminſter in Eſſex, to 19¼; at Zurich, 32¼; at Piſa, 43¼; and at Paris to 19 inches.

COMMUNICATING, in *Theology*, the act of receiving the ſacrament of the euchariſt. Thoſe of the reformed, and of the Greek church, communicate under both kinds; thoſe of the Romiſh, under only one. The oriental communicants receive the ſpecies of wine by a ſpoon, and anciently they ſucked it through a pipe, as has been obſerved by Beat. Rheanus on Tertullian.

COMMUNICATION, in a general ſenſe, the act of imparting ſomething to another.

Communication, is alſo uſed for the connection of one thing with another, or the paſſage from one place to another; thus a gallery is a communication between two apartments.

Communication of motion, the act whereby a body at reſt is put into motion by a moving body; or, it is the acceleration of motion in a body already moving.

Lines of Communication, in military matters, trenches made to continue and preſerve a ſafe correſpondence between two forts or poſts; or at a ſiege between two approaches, that they may relieve one another.

Canal of Communication. See Canal.

COMMUNION, in matters of religion, the being united in doctrine and diſcipline; in which ſenſe of the word, different churches are ſaid to hold communion with each other.

In the primitive Chriſtian church, every biſhop was obliged, after his ordination, to ſend circular letters to foreign churches, to ſignify that he was in communion with them. The three grand communions into which the Chriſtian church is at preſent divided, is that of the church of Rome, the Greek church, and the Proteſtant church: but originally all Chriſtians were in communion with each other, having one common faith and diſcipline.

Communion is alſo uſed for the act of communicating the ſacrament of the euchariſt, or the Lord's ſupper.

The fourth council of Lateran decrees, that every believer ſhall receive the communion, at leaſt, at Eaſter; which ſeems to import a tacit deſire, that they ſhould do it oftener; as, in effect, they did it much oftener in the primitive days. Gratian, and the maſter of the ſentences, preſcribe it as a rule for the laity, to communicate three times a-year, at Eaſter, Whitſuntide, and Chriſtmas. But in the 13th century, the practice was adopted, never to approach the euchariſt, except at Eaſter; and the council thought fit to enjoin it then by a law, leſt their coldneſs and remiſſneſs ſhould go farther ſtill. And the council of Trent renewed the ſame injunction, and recommended frequent communion without enforcing it by an expreſs decree.

In the ninth century, the communion was ſtill received by the laity in both kinds; or, rather, the ſpecies of bread was dipped in the wine, as is owned by the Romaniſts themſelves. (Acta SS. Benedict. Sæc. III.) M. de Marca obſerves, that they received it at firſt in their hands, Hiſt. de Bearn, and believes the communion under one kind alone to have had its riſe in the Weſt under Pope Urban II. in 1096, at the time of the conqueſt of the Holy Land. And it was more ſolemnly enjoined by the council of Conſtance in 1414. The twenty-eight canon of the council of Clermont enjoins the communion to be received under both kinds, diſtinctly; adding, however, two exceptions; the one of neceſſity, the other of caution, *niſi per neceſſitatem et cautelam*; the firſt in favour of the ſick, the ſecond of the abſtemious, or thoſe who had an averſion for wine.

It was formerly a kind of canonical puniſhment, for clerks guilty of any crime, to be reduced to *lay communion*, i. e. only to receive it as the laity did, viz. under one kind.

They had another puniſhment of the ſame nature, though under a different name, called *foreign communion*; to which the canons frequently condemned their biſhops and other clerks. This puniſhment was not any excommunication, or depoſition; but a kind of ſuſpenſion from the function of the order, and a degradation from the rank they held in the church. It had its name becauſe the communion was only granted to the criminal on the foot of a foreign clerk, i. e. being reduced to the loweſt of his order, he took place after all thoſe of his rank, as all clerks, &c. did in the churches to which they did not belong. The ſecond council of Agda orders every clerk that abſents himſelf from the church to be reduced to foreign communion.

Communion Service, in the liturgy of the church of England, the office for the adminiſtration of the holy ſacrament, extracted from ſeveral ancient liturgies, as thoſe of St Baſil, St Ambroſe, &c.

By the laſt rubric, part of this ſervice is appointed to be read every Sunday and holyday, after the morning prayer, even though there be no communicants.

COMMUNITY, denotes a ſociety of men living in the ſame place, under the ſame laws, the ſame regulations, and the ſame cuſtoms.

COMMUTATION, in *Law*, the change of a penalty or puniſhment from a greater to a leſs; as when death is commuted for baniſhment, &c.

COMNENA, Ann, daughter of Alexius Comnenus emperor of the Eaſt; memorable for her great learning and virtue, and for her hiſtory of the life and actions of her father, which is highly eſteemed. She flouriſhed about the year 1117. The hiſtory, which is in 15 books, was firſt publiſhed very imperfectly by Heſchelius in 1610; and afterwards printed in the collection of the Byzantine hiſtorians, with a diffuſe and incorrect Latin verſion by the Jeſuit Poſſimus, but with excellent notes by the learned Du Freſne.

COMO, a ſtrong and populous town of Italy, in the duchy of Milan, and in the Comaſco, with a biſhop's ſee. It was taken by the Imperialiſts in 1706, and is ſeated on a lake of the ſame name, in E. Long. 8. 57. N. Lat. 45. 45.

Como, the lake ſo called, is the largeſt in Italy. It is ſituated in the duchy of Milan in the Comaſco, on the confines of Switzerland and the Griſons. It is 88 miles in circumference, yet is not above 6 miles over in any part.

COMORA iſlands, lie between the north end of the iſland of Madagaſcar and the coaſt of Zanguebar, from 10 to 15 degrees ſouth latitude. Authors differ greatly with regard to their number, ſome ſpeaking of three, others of five, and ſome of eight of theſe iſlands. They all abound in horned cattle, ſheep, hogs, and a variety of fruits common in warm countries. They are ſaid alſo to produce a kind of rice which turns of a violet colour when boiled. The moſt remarkable of them, and which the Europeans are beſt acquainted with, is the iſland of Johanna. See that article.

COMORIN, or Cape Comorin, the moſt ſoutherly promontory of the Hither India, lying north-weſt of the iſland of Ceylon.

COMORRA, a handſome and large town of Lower Hungary, and capital of a territory of the ſame name. It is ſo well fortified, that the Turks could never take it. The greateſt part of the inhabitants are Hungarians or Ruſſians, who are very rich, and are of the Greek religion. It is ſeated on the river Danube, in the iſland of Silbut. E. Long. 18. 5. N. Lat. 47. 46.

COMOSÆ, in *Botany*, from *Coma*; an order of plants in the former edition of Linnæus's Fragments of a Natural Method, conſiſting of the ſpiked willow or ſpiræa frutex, dropwort, and greater meadowſweet. Theſe, though formerly diſtinct genera, are by Linnæus collected into one, under the name of *ſpiræa*. The flowers growing in a head, reſemble a buſh, or tuft of hair, which probably gave riſe to the epithet *Comoſæ*.

COMPACT, in *Philoſophy*, is ſaid of bodies which are of a cloſe, denſe, and heavy texture, with few pores, and thoſe very ſmall.

Compact, in a legal ſenſe, ſignifies an agreement or contract ſtipulated between ſeveral parties.

COMPANION, one with whom a man frequently converſes.

As the human mind cannot always be on the ſtretch, nor the hands always employed in labour, recreation becomes both agreeable and neceſſary. Of all recreations, that of the company of a few choſen companions muſt be allowed to be the moſt manly and moſt improving: but as in thoſe hours of recreation we are moſt in danger of being miſled, being generally at ſuch ſeaſons more off our guard than uſual, the greateſt care ſhould be taken in making choice of whom to aſſociate with; for according to our choice of them, both our character and diſpoſition will receive a tincture, as waters paſſing through minerals partake of their taſte and efficacy. This is a truth ſo univerſally received, that it is become a proverb both in the natural and moral world, That a man is known by his company. As by chemiſtry we learn, that diſcordant mixtures produce nothing but broil and fermentation till one of them gets the aſcendency of the reſt; ſo from Scripture we learn, that two cannot walk together except they be agreed. From which we may ſee, how impoſſible it is for any one to be thought a perſon of real goodneſs and integrity, whilſt he chooſes for his companions the abandoned and licentious.

By aſſociating with ſuch, he will not only loſe his character, but his virtue; for whatever fallacious diſtinction he may be pleaſed to make between the men and their vices, in the end the firſt generally qualifies the laſt; and by ceaſing to hate them he will ſoon learn both to love and practiſe them. In ſhort, the ſociety of ſenſual men is peculiarly enſnaring. The malignity of their contagion doth not appear all at once. Their frolics firſt appear harmleſs; then, when partaken of, they leave a longing reliſh behind them; and one appointment makes way for another, one expence leads on to a ſecond; and ſo time and fortune are waſted away to very bad purpoſe. Then one appetite craves, and another muſt be gratified, till all become too importunate to be denied; which verifies what the wiſeſt of men long ſince ſaid, "That the beginning of ſin is like the breaking forth of waters, which when it once makes an entrance, carries all before it with ruſhing impetuoſity." Some pangs of remorſe may be felt by the infatuated creature on his firſt degeneracy, and ſome faint reſolutions againſt being ſeduced any more; which will no ſooner be diſcovered by thoſe leaders to deſtruction, than all arts will be uſed to allure him back to bear them company in the broad beaten path to ruin. Of all which methods, none is more to be dreaded than raillery; for this is generally exerciſed with all its force, and too often proves fatal. Another method uſed to miſlead the young novice not yet hackneyed in vice, and no leſs dangerous than the other, is to call evil good, and good evil. Luſt and ſenſuality muſt paſs for love and gallantry; revenge and malice, for heroiſm. But ſteadineſs ſhould be ſhown, by holding ſuch peſts of ſociety in deriſion, and looking on them with contempt; by appearing unmoved by their ill-founded banters, and unſtung by their impious jeſts.

Upon the whole, in order to eſcape the danger which attends the keeping of evil company, let thoſe you aſſociate with be perſons as carefully educated and as honeſtly diſpoſed as yourſelf; of a good moral character, not given to any known vice; whoſe lives are temperate, and whoſe expences are moderate: with ſuch company as theſe, you will neither get diſcredit, nor degenerate into exceſs. You will be a mutual check to each other; and your reputation will be ſo eſtabliſhed, that it will be the ambition of others to be admitted members of your ſociety. Select thoſe for your companions who are men of good ſenſe and underſtanding; and, if poſſible, who excel in ſome art, ſcience, or accompliſhment; that ſo, in the courſe of your acquaintance, your very hours of amuſement may contribute to your improvement; and for the moſt part ſuch are open and communicative, and take as much pleaſure in being heard as you to be informed. By purſuing ſuch a conduct, you will be an ornament and uſeful member of ſociety.

COMPANY, a collective term, underſtood of ſeveral perſons aſſembled together in the ſame place, or with the ſame deſign. The word is formed of the French *compagnie*, and that of *companio*, or *companies*, which Chifflet obſerves, are found in the Salic law, tit. 66. and are proper military words, underſtood of ſoldiers, who, according to the modern phraſe, are comrades or meſs-mates, i. e. lodge together, eat together, &c. of the Latin *cum*, "with," and *panis*, "bread." It may be added, that in ſome Greek authors under the weſtern empire, the word κȣμπανια occurs in the ſenſe of ſociety.

Company, in a familiar or faſhionable ſenſe, is uſed for an aſſemblage of perſons met for the purpoſe of converſation, paſtime, or feſtivity.

The love of company and of ſocial pleaſures is natural, and attended with ſome of the ſweeteſt ſatiſfactions of human life; but, like every other love, when it proceeds beyond the limits of moderation, it ceaſes to produce its natural effect, and terminates in diſguſtful ſatiety. The foundation-ſtone and the pillar on which we build the fabric of our felicity, muſt be laid in our own hearts. Amuſement, mirth, agreeable variety, and even improvement, may be ſometimes ſought in the gaiety of mixed company, and in the uſual diverſions of the world; but if we found our general happineſs on theſe, we ſhall do little more than raiſe caſtles in the air, or build houſes on the ſand.

To derive the proper pleaſure and improvement from company, it ought to be ſelect, and to conſiſt of perſons of character, reſpectable both for their morals and their underſtandings. Mixed and undiſtinguiſhed ſociety tends only to diſſipate our ideas, and induce a laxity of principles and practice. The pleaſure it affords is of a coarſe, mixed, noiſy, and rude kind. Indeed, it commonly ends in wearineſs and diſguſt, as even they are ready to confeſs who yet conſtantly purſue it, as if their chief good conſiſted in living in a crowd.

Among thoſe, indeed, who are exempted by their circumſtances from profeſſional and official employments, and who profeſſedly devote themſelves to a life of pleaſure, little elſe ſeems to conſtitute the idea of it, but an unceaſing ſucceſſion of company, public or private. The dreſs, and other circumſtances preparatory to the enjoyment of this pleaſure, ſcarcely leave a moment for reflection. Day after day is ſpent in the ſame toilſome round, till a habit is formed, which renders diſſipation neceſſary to exiſtence. One week without it would probably induce a lowneſs of ſpirits, which might terminate in deſpair and ſuicide. When the mind has no anchor, it will ſuffer a kind of ſhipwreck; it will ſink in whirlpools, and be daſhed on rocks. What, indeed, is life or its enjoyments without ſettled principles, laudable purpoſes, mental exertions, and internal comfort? It is merely a vapour, or, to drop the language of figure on ſo ſerious a ſubject, it is a ſtate worſe than non-entity, ſince it poſſeſſes a reſtleſs power of action, productive of nothing but miſery.

It is recommended, therefore, to all who wiſh to enjoy their exiſtence (and who entertains not that wiſh?) that they ſhould acquire a power not only of bearing, but of taking a pleaſure in, temporary ſolitude. Every one muſt, indeed, ſometimes be alone. Let him not repine when he is alone, but learn to ſet a value on the golden moments. It is then that he is enabled to ſtudy himſelf and the world around him. It is then that he has an opportunity of ſeeing things as they are, and of removing the deceitful veil, which almoſt every thing aſſumes in the buſy ſcene of worldly employments. The ſoul is enabled to retire into herſelf, and to exert thoſe energies which are always attended with ſublime pleaſure. She is enabled to ſee the dependent, frail, and wretched ſtate of man as the child of nature; and incited by her diſcovery, to implore grace and protection from the Lord of the univerſe. They, indeed, who fly from ſolitude, can ſeldom be religious; for religion requires meditation. They may be ſaid to "live without God in the world;" not, it is true, from atheiſtical principles, but from a carleſſneſs of diſpoſition; a truly deplorable ſtate, the conſciouſneſs of which could not fail to cloud the gaiety of thoſe halcyon beings who ſport in the ſunſhine of unremitted pleaſure.

There is no doubt that man is made for action, and that his duties and pleaſures are often moſt numerous and moſt important amidſt the buſy hum of men. Many vices, and many corrupt diſpoſitions, have been foſtered in a ſolitary life. Monkery is not favourable to human nature or human happineſs; but neither is unlimited diſſipation.

In ſhort, let there be a ſweet interchange of retirement and aſſociation, of repoſe and activity. A few hours ſpent every day by the votaries of pleaſure in ſerious meditation, would render their pleaſure pure, and more unmixed with miſery. It would give them knowledge, ſo that they would ſee how far they might advance in their purſuit without danger; and reſolution, ſo that they might retreat when danger approached. It would teach them how to live, a knowledge which indeed they think they poſſeſs already; and it would alſo teach them, what they are often too little ſolicitous to learn, how to die.

Company, in a commercial ſenſe, is a ſociety of merchants, mechanics, or other traders, joined together in one common intereſt.

When there are only two or three joined in this manner, it is called a partnerſhip; the term *company* being reſtrained to ſocieties conſiſting of a conſiderable number of members, aſſociated together by a charter obtained from the prince.

The mechanics of all corporations, or towns incorporated, are thus erected into companies, which have charters of privileges and large immunities.

COMPANY ſeems more particularly appropriated to thoſe grand aſſociations ſet on foot for the commerce of the remote parts of the world, and veſted by charter with peculiar privileges.

When companies do not trade upon a joint ſtock, but are obliged to admit any perſon, properly qualified, upon paying a certain fine and agreeing to ſubmit to the regulations of the company, each member trading upon his own ſtock and at his own riſk, they are called *Regulated Companies*. When they trade upon a joint ſtock, each member ſharing in the common profit or loſs in proportion to his ſhare in this ſtock, they are called *Joint-ſtock Companies*. Such companies, whether regulated or joint-ſtock, ſometimes have, and ſometimes have not, excluſive privileges.

However injurious companies with joint-ſtock, and incorporated with excluſive privileges, may at this time be reckoned to the nation in general, it is yet certain that they were the general parent of all our foreign commerce; private traders being diſcouraged from hazarding their fortunes in foreign countries, until the method of traffic had been firſt ſettled by joint-ſtock companies. But ſince the trade of this kingdom and the number of traders have increaſed, and the methods of aſſurance of ſhipping and merchandiſe, and the navigation to all parts of the known world have become familiar to us, theſe companies, in the opinion of moſt men, have been looked upon in the light of monopolies; their privileges have therefore been leſſened from time to time, in order to favour a free and general trade; and experience has ſhown, that the trade of the nation has advanced in proportion as monopolies have been diſcouraged. In ſhort, as all reſtrictions of trade are found to be hurtful, nothing can be more evident, than that no company whatſoever, whether they trade in a joint-ſtock or only under regulation, can be for the public good, except it may be eaſy for all or any of his majeſty's ſubjects to be admitted into all or any of the ſaid companies, at any time, and for a very inconſiderable fine.

I. REGULATED Companies reſemble, in every reſpect, the corporations of trades, ſo common in the cities and towns of all the different countries of Europe; and are a ſort of enlarged monopolies of the ſame kind. As no inhabitant of a town can exerciſe an incorporated trade, without firſt obtaining his freedom in the corporation; ſo in moſt caſes no ſubject of the ſtate can lawfully carry on any branch of foreign trade, for which a regulated company is eſtabliſhed, without firſt becoming a member of that company. The monopoly is more or leſs ſtrict according as the terms of admiſſion are more or leſs difficult; and according as the directors of the company have more or leſs authority, or have it more or leſs in their power to manage in ſuch a manner as to confine the greater part of the trade to themſelves and their particular friends. In the moſt ancient regulated companies the privileges of apprenticeſhip were the ſame as in other corporations; and entitled the perſon who had ſerved his time to a member of the company, to become himſelf a member, either without paying any fine, or upon paying a much ſmaller one than what was exacted of other people. The uſual corporation ſpirit, wherever the law does not reſtrain it, prevails in all regulated companies. When they have been allowed to act according to their natural genius, they have always, in order to confine the competition to as ſmall a number of perſons as poſſible, endeavoured to ſubject the trade to many burdenſome regulations. When the law has reſtrained them from doing this, they have become altogether uſeleſs and inſignificant.

The regulated companies for foreign commerce, which at preſent ſubſiſt in Great Britain, are, The Hamburgh Company, the Ruſſia Company, the Eaſtland Company, the Turkey Company, and the African Company.

1. *The Hamburgh Company* is the oldeſt trading eſtabliſhment in the kingdom; though not always known by that name, nor reſtrained to thoſe narrow bounds under which it is now confined. It was firſt called the *Company of Merchants trading to Calais, Holland, Zealand, Brabant, and Flanders*: then it acquired the general title of *Merchant-adventurers of England*: as being compoſed of all the Engliſh merchants who traded to the Low Countries, the Baltic, and the German ocean. Laſtly, it was called the *Company of Merchant-adventurers of England trading to Hamburgh*.

This company was firſt incorporated by Edward I. in 1296; and eſtabliſhed again, by charter, in 1406, under the reign of King Henry IV. It was afterwards confirmed, and augmented with divers privileges, by many of his ſucceſſors. Before the charter of Henry IV. all the Engliſh merchants who trafficked out of the realm, were left to their own diſcretion, and managed their affairs with foreigners as might be moſt for their reſpective intereſts, without any regard to the general commerce of the nation. Henry, obſerving this diſorder, endeavoured to remedy it, by uniting all the merchants in his dominions into one body; wherein, without loſing the liberty of trading each for himſelf, they might be governed by a company ſtill ſubſiſting; and be ſubject to regulations, which ſhould ſecure the general intereſt of the national commerce, without prejudice to the intereſt of particulars. With this view, he granted all the merchants of his ſtates, particularly thoſe of Calais, then in his hands, a power of aſſociating themſelves into a body politic, with directors and governors, both in England and abroad; to hold aſſemblies, both for the direction of buſineſs and the deciding of controverſies among merchants; make laws; puniſh delinquents; and impoſe moderate duties and taxes on merchandiſes, and merchants, to be employed in the ſervice of the corporation. Theſe few articles of the charter of Henry IV. were afterwards much augmented by Henry VII. who firſt gave them the title of *Merchant-adventurers to Calais, Holland*, &c. gave them a power of proclaiming and continuing free fairs at Calais; and ordered, that to be reputed a member of the ſociety, each perſon pay 20 marks ſterling; and that the ſeveral members ſhould attend the general meetings, or courts, appointed by the directors, whether at London, Calais, or elſewhere.

A petition being made to Queen Elizabeth, in 1564, for an explanation of certain articles in the charter of Henry VII. and a confirmation of the reſt granted by other kings; that princeſs, by a charter of the ſame year, declares that, to end all diſputes, they ſhall be incorporated anew, under the title of the *Company of Merchant-adventurers of England;* that all who were members of the former company ſhould, if they deſired it, be admitted members of this; that they ſhould have a common ſeal; that they ſhould admit into their ſociety what other perſons, and on what terms, they pleaſed, and expel them again on miſbehaviour; that the city of Hamburgh and neighbouring cities ſhould be reputed within their grant, together with thoſe of the Low Countries, &c. in that of the former company; that no member ſhould marry out of the kingdom, nor purchaſe lands, &c. in any city beyond ſea; and that thoſe who do, ſhall be, *ipſo facto*, excluded forever. Twenty-two years after this firſt charter, Queen Elizabeth granted them a ſecond; confirming the former, and further granting them a privilege of excluſion; with a power of erecting in each city within their grant a ſtanding council.

The revolutions which happened in the Low Countries towards the end of the ſixteenth century, and which laid the foundation of the republic of Holland, having hindered the company from continuing their commerce with their ancient freedom; it was obliged to turn it almoſt wholly to the ſide of Hamburgh, and the cities on the German ocean; from which change, ſome people took occaſion to change its name to that of the *Hamburgh Company*; though the ancient title of *Merchant-adventurers* is ſtill retained in all their writings.

About the middle of the laſt century, the fine for admiſſion was fifty, and at one time one hundred pounds, and the conduct of the company was ſaid to be extremely oppreſſive. In 1643, in 1645, and in 1661, the clothiers and free traders of the weſt of England complained of them to parliament, as of monopoliſts who confined the trade and oppreſſed the manufactures of the country. Though thoſe complaints produced no act of parliament, they had probably intimidated the company ſo far, as to oblige them to reform their conduct. The terms of admiſſion are now ſaid to be quite eaſy; and the directors either have it not in their power to ſubject the trade to any burdenſome reſtraint or regulations, or at leaſt have not of late exerciſed that power.

2. *The Ruſſia Company* was firſt projected towards the end of the reign of King Edward VI. executed in the firſt and ſecond years of Philip and Mary; but had not its perfection till its charter was confirmed by act of parliament, under Queen Elizabeth, in 1566. It had its riſe from certain adventurers, who were ſent in three veſſels on the diſcovery of new countries; and to find out a north-eaſt paſſage to China: theſe, falling into the White ſea, and making up to the port of Archangel, were exceedingly well received by the Muſcovites; and, at their return, ſolicited letters patent to ſecure to themſelves the commerce of Ruſſia, for which they had formed an aſſociation.

By their charter, the aſſociation was declared a body politic, under the name of the *Company of Merchant-adventurers of England, for the diſcovery of lands, territories, iſlands,* &c. *unknown, or unfrequented.* Their privileges were, to have a governor, four conſuls, and 24 aſſiſtants, for their commerce; for their policy, to make laws, inflict penalties, ſend out ſhips to make diſcoveries, take poſſeſſion of them in the king's name, ſet up the banner royal of England, plant them; and laſtly, the excluſive privilege of trading to Archangel, and other ports of Muſcovy, not yet frequented by the Engliſh.

This charter not being ſufficiently guarded, was confirmed by parliament in the eighth year of Queen Elizabeth; wherein it was enacted, that in regard the former name was too long, they ſhould now be called *Company of Engliſh Merchants for diſcovering new trades;* under which name, they ſhould be capable of acquiring and holding all kind of lands, manors, rents, &c. not exceeding 100 marks per annum, and not held of her majeſty; that no part of the continent, iſland, harbour, &c. not known or frequented before the firſt enterpriſe of the merchants of their company, ſituated to the north, or north-weſt, or north-eaſt of London; nor any part of the continent, iſlands, &c. under the obedience of the emperor of Ruſſia, or in the countries of Armenia, Media, Hyrcania, Perſia, or the Caſpian ſea, ſhould be viſited by any ſubjects of England, to exerciſe any commerce, without the conſent of the ſaid company, on pain of confiſcation. The ſaid company ſhall uſe no ſhips in her new commerce but thoſe of the nation; nor tranſport any cloths, ſerges, or other woollen ſtuffs, till they have been dyed and preſſed. That in caſe the company diſcontinue of itſelf to unload commodities in the road of the abbey of S. Nicolas, in Ruſſia, or ſome other port, on the north coaſts of Ruſſia, for the ſpace of three years, the other ſubjects of England ſhall be allowed to traffic to Narva, while the ſaid company diſcontinues its commerce into Ruſſia, only uſing Engliſh veſſels.

This company ſubſiſted with reputation almoſt a whole century, till the time of the civil wars. It is ſaid, the czar then reigning, hearing of the murder of King Charles I. ordered all the Engliſh in his ſtates to be expelled; which the Dutch taking the advantage of, ſettled in their room. After the reſtoration, the remains of the company re-eſtabliſhed part of their commerce at Archangel, but never with the ſame ſucceſs as before; the Ruſſians being now well accuſtomed to the Dutch merchants and merchandiſe.

This company ſubſiſts ſtill, under the direction of a governor, four conſuls, and aſſiſtants. By the 10th and 11th of William III. c. 6. the fine for admiſſion was reduced to 5l.

3. *The Eaſtland Company* was incorporated by Queen Elizabeth. Its charter is dated in the year 1579. By the firſt article the company is erected into a body politic, under the title of the *Company of Merchants of the Eaſt;* to conſiſt of Engliſhmen, all real merchants who have exerciſed the buſineſs thereof, and trafficked through the Sound, before the year 1568, into Norway, Sweden, Poland, Livonia, Pruſſia, Pomerania, &c. as alſo Revel, Coningſberg, Dantzick, Copenhagen, &c. excepting Narva, Muſcovy, and its dependencies. Moſt of the following articles grant them the uſual prerogatives of ſuch companies as a ſeal, governor, courts, laws, &c.

The privileges peculiar to this company are, that none ſhall be admitted a member who is already a member of any other company; nor any retail-dealer at all. That no merchant qualified be admitted without paying ſix pounds thirteen ſhillings and ſixpence. That a member of another company, deſiring to renounce the privileges thereof, and to be received into that of the Eaſt ſhall be admitted *gratis;* provided he procures the ſame favour for a merchant of the Eaſt willing to fill his place. That the merchant-adventurers who never dealt in the Eaſt, in the places expreſſed in the charter, may be received as members of the company on paying 40 marks; that, notwithſtanding this union of the Adventurers of England with the company of the Eaſt, each ſhall retain its rights and privileges. That they ſhall export no cloths but what are dyed and preſſed, except a hundred pieces per annum, which are allowed them *gratis*. This charter was confirmed by Charles II. in 1629, with this addition, that no perſon, of what quality ſoever, living in London, ſhould be admitted a member, unleſs he were free of the city. This company was complained of as a monoply, and firſt curtailed by legal authority in 1672; and ſince the declaration of rights in 1689, exiſt only in name; but ſtill continue to elect their annual officers, who are a governor, a deputy, and twenty-four aſſiſtants.

7. *The Turkey or Levant Company,* had its riſe under Queen Elizabeth, in 1581. James I. confirmed its charter in 1605, adding new privileges. During the civil wars, there happened ſome innovations in the government of the company; many perſons having been admitted members, not qualified by the charters of Queen Elizabeth and King James, or that did not conform to the regulations preſcribed. Charles II. upon his reſtoration, endeavoured to ſet it upon its ancient baſis; to which end, he gave them a charter, containing not only a confirmation of their old one, but alſo ſeveral new articles of reformation. By this, the company is erected into a body politic, capable of making laws, &c. under the title of the *Company of Merchants of England trading to the ſeas of the Levant.* The number of members is not limited, but is ordinarily about three hundred. The principal qualification required is, that the candidate be a freeman of London, and a wholeſale merchant, either by family or by ſerving an apprenticeſhip of ſeven years. Thoſe under 25 years of age pay 25l. ſterling at their admiſſion; thoſe above, twice as much. This fine was reduced by act of parliament, in 1753, to 20l. and the privilege of admiſſion extended to every Britiſh ſubject. Each makes oath at his entrance not to ſend any merchandiſes to the Levant but on his own account; and not to conſign them to any but the company's agents or factors. This reſtriction is likewiſe enlarged by the above-mentioned ſtatute.

The company has a court or board at London, which is compoſed of a governor, deputy-governor, and fifteen directors or aſſiſtants, who are all actually to live in London or the ſuburbs. They have alſo a deputy-governor in every city and port, where there are any members of the company. The aſſembly at London ſends out the veſſels, regulates the tariff for the price at which the European merchandiſes ſent to the Levant are to be ſold, and for the quality of thoſe returned. It raiſes taxes on merchandiſes, to defray impoſitions, and the common expences of the company; preſents the ambaſſador which the king is to keep at the Porte, elects two conſuls for Smyrna and Conſtantinople, &c.

One of the beſt regulations of the company is, not to leave the conſuls, or even ambaſſador, to fix the impoſition on veſſels for defraying the common expences (a thing fatal to the companies of moſt other nations); but to allow a penſion to the ambaſſador and conſuls, and even to the chief officers, as ſecretary, chaplain, interpreters, and janizaries, that there may not be any pretence for their raiſing any ſum at all on the merchants or merchandiſes.

In extraordinary caſes, the conſuls, and even the ambaſſador, have recourſe to two deputies of the company, reſiding in the Levant; or, if the affair be very important, they aſſemble the whole body. Here are regulated the preſents to be given, the voyages to be made, and every thing to be deliberated; and on the reſolutions here taken, the deputies appoint the treaſurer to furniſh the moneys, &c. required.

The ordinary commerce of this company employs from 20 to 25 veſſels, carrying from 25 to 30 pieces of cannon. The merchandiſes exported thither are, cloths of all kinds and colours, pewter, lead, pepper, cochineal, and a great deal of ſilver, which they take up at Cadiz: the returns are in raw ſilk, galls, camlets, wools, cottons, Morocco leather, aſhes for making glaſs and ſoap, and ſeveral gums and medicinal drugs. The commerce to Smyrna, Conſtantinople, and Scanderoon, is not eſteemed much leſs conſiderable than that of the Eaſt India Company; but is, doubtleſs, more advantageous to Britain; becauſe it takes off much more of the Britiſh manufactures than the other, which is chiefly carried on in money. The places reſerved for the commerce of this company are, all the ſtates of Venice, in the gulf of Venice; the ſtate of Raguſa; all the ſtates of the grand ſeignior, and the ports of the Levant and Mediterranean; excepting Carthagena, Alicant, Barcelona, Valencia, Marſeilles, Toulon, Genoa, Leghorn, Civita Vecchia, Palermo, Meſſina, Malta, Majorca, Minorca, and Corſica; and other places on the coaſts of France, Spain, and Italy.

5. *The Company of Merchants trading to Africa,* eſtabliſhed in 1750. Contrary to the former practice with regard to regulated companies, who were reckoned unfit for ſuch ſort of ſervice, this company was ſubjected to the obligation of maintaining forts and garriſons. It was expreſsly charged at firſt with the maintenance of all the Britiſh forts and garriſons that lie between Cape Blanc and the Cape of Good Hope, and afterwards with that of thoſe only which lie between Cape Rouge and the Cape of Good Hope. The act which eſtabliſhes this company (the 23d of George II. c. 31.) ſeems to have had two diſtinct objects in view; firſt, to reſtrain effectually the oppreſſive and monopolizing ſpirit which is natural to the directors of a regulated company; and ſecondly, to force them as much as poſſible to give an attention, which is not natural to them, towards the maintenance of forts and garriſons.

For the firſt of theſe purpoſes, the fine for admiſſion is limited to forty ſhillings. The company is prohibited from trading in their corporate capacity, or upon a joint ſtock; from borrowing money upon common

mon ſeal, or from laying any reſtraints upon the trade which may be carried on freely from all places, and by all perſons being Britiſh ſubjects, and paying the fine. The government is in a committee of nine perſons who meet at London, but who are choſen annually by the freemen of the company at London, Briſtol, and Liverpool; three from each place. No committee-man can be continued in office for more than three years together. Any committee-man might be removed by the board of trade and plantations; now by a committee of council, after being heard in his own defence. The committee are forbid to export negroes from Africa, or to import any African goods into Great Britain. But, as they are charged with the maintenance of forts and garriſons, they may for that purpoſe export from Great Britain to Africa goods and ſtores of different kinds. Out of the money which they ſhall receive from the company, they are allowed a ſum not exceeding eight hundred pounds, for the ſalaries of their clerks and agents at London, Briſtol, and Liverpool; the houſe-rent of their office at London; and all other expences of management, commiſſion, and agency, in England. What remains of this ſum, after defraying thoſe different expences, they may divide among themſelves, as compenſation for their trouble, in what manner they think proper. "By this conſtitution, it might have been expected (Dr Smith obſerves), that the ſpirit of monopoly would have been effectualy reſtrained, and the firſt of theſe purpoſes ſufficiently anſwered. It would ſeem however, that it had not. Though by the 4th of George III. c. 20. the fort of Senegal, with all its depenencies, had been veſted in the company of merchants trading to Africa, yet in the year following (by the 5th of George III. c. 44.), not only Senegal and its dependencies, but the whole coaſt from the port of Sallee, in ſouth Barbary, to Cape Rouge, was exempted from the juriſdiction of that company, was veſted in the crown, and the trade to it declared free to all his majeſty's ſubjects. The company had been ſuſpected of reſtraining the trade, and of eſtabliſhing ſome ſort of improper monopoly. It is not, however, very eaſy to conceive how, under the regulations of the 23d George II. they could do ſo. From the printed debates of the houſe of commons (not always the moſt authentic records of truth), it appears, however, that they have been accuſed of this. The members of the committee of nine being all merchants, and the governors and factors, in their different forts and ſettlements, being all dependent upon them, it is not unlikely that the latter might have given peculiar attention to the conſignments and commiſſions of the former, which would eſtabliſh a real monopoly."

For the ſecond purpoſe mentioned, the maintenance of the forts and garriſons, an annual ſum has been allotted to them by parliament, generally about 13,000l. For the proper application of this ſum, the committee is obliged to account annually to the curſitor baron of exchequer; which account is afterwards to be laid before parliament. "But parliament (continues our author), which gives ſo little attention to the application of millions, is not likely to give much to that of 13,000l. a-year; and the curſitor baron of exchequer, from his profeſſion and education, is not likely to be profoundly ſkilled in the proper expence of forts and garriſons. The captains of his majeſty's navy, indeed, or any other commiſſioned officers, appointed by the board of admiralty, may inquire into the condition of the forts and garriſons, and report their obſervations to that board. But that board ſeems to have no direct juriſdiction over the committee, nor any authority to correct thoſe whoſe conduct it may thus inquire into; and the captains of his majeſty's navy, beſides, are not ſuppoſed to be always deeply learned in the ſcience of fortification. Removal from an office, which can be enjoyed only for the term of three years, and of which the lawful emoluments, even during that term, are ſo very ſmall, ſeems to be the utmoſt puniſhment to which any committee-man is liable, for any fault, except direct malverſation, or embezzlement either of the public money or of that of the company; and the fear of that puniſhment, can never be a motive of ſufficient weight to force a continual and careful attention to a buſineſs to which he has no other intereſt to attend. The committee are accuſed of having ſent out bricks and ſtones from England for the reparation of Cape Coaſt Caſtle on the coaſt of Guinea, a buſineſs for which parliament had ſeveral times granted an extraordinary ſum of money. Theſe bricks and ſtones too, which had thus been ſent upon ſo long a voyage, were ſaid to have been of ſo bad a quality, that it was neceſſary to rebuild from the foundation the walls which had been repaired with them. The forts and garriſons which lie north of Cape Rouge are not only maintained at the expence of the ſtate, but are under the immediate government of the executive power; and why thoſe which lie ſouth of that cape, and which too are, in part at leaſt, maintained at the expence of the ſtate, could be under a different government, it ſeems not very eaſy even to imagine a good reaſon."

The above company ſucceeded that called *The Royal African Company*, which traded upon a joint ſtock with an excluſive privilege. Though England began to trade to Africa as early as the year 1536, and ſeveral voyages were made to Guinea in 1588, and ſome following years, for the importation of gold and elephants teeth, nothing like a company was formed till the year 1588, when Queen Elizabeth granted a patent of excluſive privilege to certain perſons for ten years. In 1618, King James I. eſtabliſhed a company by charter, which was ſoon diſſolved. Another company was erected by charter of Charles I. in 1631, which met with little ſucceſs; but the demand for negroes in the Engliſh American plantations increaſing, a third company was eſtabliſhed by a charter granted 1662, in favour of the duke York; ſecuring to him the commerce of all the country, coaſts, iſlands, &c. belonging to the crown of England, or not poſſeſſed by any other Chriſtian prince, from Cape Blanco in 20° N. Lat. to the Cape of Good Hope, in 34° 34′ S. Lat. The charter was ſoon after returned into the king's hands by the duke, and revoked, by conſent of the parties aſſociated with him in the enterprize; in conſequence of which, the fourth and laſt excluſive company was eſtabliſhed and incorporated by letters patent in 1672, under the title of the *Royal African Company*. A capital was ſoon raiſed of 111,000l. and this new company improved their trade, and increaſed their forts; but after the revolution in 1689, this trade was laid open. In 1698, all private traders to Africa were obliged by ſtat. 9 and 10 Will. to pay ten *per cent.* in order to aſſiſt the company in maintaining their forts and factories. But notwithſtanding this heavy tax, the company were ſtill unable to maintain the competition; their ſtock and credit gradually declined. In 1712, their debts had become ſo great, that a particular act of parliament was thought neceſſary, both for their ſecurity and for that of their creditors. It was enacted, that the reſolution of two-thirds of theſe creditors in number and value ſhould bind the reſt, both with regard to the time which ſhould be allowed to the company for the payment of their debts, and with regard to any other agreement which it might be thought proper to make with them concerning thoſe debts. In 1730, their affairs were in ſo great diſorder, that they were altogether incapable of maintaining their forts and garriſons; the ſole purpoſe and pretext of their inſtitution. From that year till their final diſſolution, the parliament judged it neceſſary to allow the annual ſum of ten thouſand pounds for that purpoſe. In 1732, after having been for many years loſers by the trade of carrying negroes to the Weſt Indies, they at laſt reſolved to give it up altogether; to ſell to the private traders to America the negroes which they purchaſed upon the coaſt; and to employ their ſervants in a trade to the inland parts of Africa for gold duſt, elephants teeth, dyeing drugs, &c. But their ſucceſs in this more confined trade was not greater than in their former extenſive one. Their affairs continued to go gradually to decline, till at laſt being in every reſpect a bankrupt company, they were diſſolved by act of parliament, and their forts and garriſons veſted in the preſent *Regulated Company of Merchants trading to Africa*.

II. *Joint-Stock Companies*, eſtabliſhed either by royal charter or by act of parliament, differ in ſeveral reſpects not only from regulated companies, but from private copartneries. 1. In a private copartnery, no partner, without the conſent of the company, can transfer his ſhare to another perſon, or introduce a new member into the company. Each member, however, may, upon proper warning, withdraw from the copartnery, and demand payment from them of his ſhare of the common ſtock. In a joint-ſtock company, on the contrary, no member can demand payment of his ſhare from the company; but each member can, without their conſent, transfer his ſhare to another perſon, and thereby introduce a new member. The value of a ſhare in a joint-ſtock is always the price which it will bring in the market; and this may be either greater or leſs, in any proportion, than the ſum which its owner ſtands credited for in the ſtock of the company. 2. In a private copartnery, each partner is bound for the debts contracted by the company to the whole extent of his fortune. In a joint-ſtock company, on the contrary, each partner is bound only to the extent of his ſhare.

The trade of a joint-ſtock company is always managed by a court of directors. This court indeed is frequently ſubject, in many reſpects, to the controul of a general court of proprietors. But the greater part of thoſe proprietors ſeldom pretend to underſtand any thing of the buſineſs of the company; and when the ſpirit of faction happens not to prevail among them, give themſelves no trouble about it, but receive contentedly ſuch half-yearly or yearly dividend as the directors think proper to make to them. This total exemption from trouble and from riſk, beyond a limited ſum, encourages many people to become adventurers in joint-ſtock companies, who would upon no account hazard their fortunes in any private copartnery. Such companies, therefore, commonly draw to themſelves much greater ſtocks than any private copartnery can boaſt of. The trading ſtock of the South Sea Company, at one time, amounted to upwards of thirty-three millions eight hundred thouſand pounds. The directors of ſuch companies, however, being the managers rather of other people's money than of their own, it cannot well be expected that they ſhould watch over it with the ſame anxious vigilance with which the partners in a private copartnery frequently watch over their own. Like the ſtewards of a rich man, they are apt to conſider attention to ſmall matters as not for their maſter's honour, and very eaſily give themſelves a diſpenſation from having it. Negligence and profuſion, therefore, muſt always prevail, more or leſs, in the management of the affairs of ſuch a company. It is upon this account that joint-ſtock companies for foreign trade have ſeldom been able to maintain the competition againſt private adventurers. They have, accordingly, very ſeldom ſucceeded without an excluſive privilege; and frequently have not ſucceeded with one. Without an excluſive privilege they have commonly miſmanaged the trade. With an excluſive privilege they have both miſmanaged and confined it.

The principal joint-ſtock companies preſently ſubſiſting in Great Britain are, the *South Sea* and the *Eaſt India* companies; to which may be added, though of very inferior magnitude, the *Hudſon's Bay* Company.

1. *The South-Sea Company.* During the long war with France in the reign of Queen Anne, the payment of the ſailors of the royal navy being neglected, they received tickets inſtead of money, and were frequently obliged, by their neceſſities, to ſell theſe tickets to avaricious men at a diſcount of 40 and ſometimes 50 *per cent.* By this and other means, the debts of the nation unprovided for by parliament, and which amounted to 9,471,321l. fell into the hands of theſe uſurers. On which Mr Harley, at that time chancellor of the exchequer, and afterwards earl of Oxford, propoſed a ſcheme to allow the proprietors of theſe debts and deficiencies 6 *per cent. per annum*, and to incorporate them for the purpoſe of carrying on a trade to the South Sea; and they were accordingly incorporated under the title of "the Governor and Company of Merchants of Great Britain trading to the South Seas, and other parts of America, and for encouraging the Fiſhery," &c.

Though this company ſeemed formed for the ſake of commerce, the miniſtry never thought ſeriouſly, during the courſe of the war, about making any ſettlement on the coaſt of South America, which was what flattered the expectations of the people; nor was it ever carried into execution by this company.

Some other ſums were lent to the governor in the reign of Queen Anne at 6 per cent. In the third of George I. the intereſt of the whole was reduced to 5 per cent. and the company advanced two millions more to the government at the ſame intereſt. By the ſtatute of the 6th of George I. it was declared, that they might redeem all or any of the redeemable national debts; in conſideration of which, the company were empowered to augment their capital according to the ſums they ſhould diſcharge: and for enabling them to raiſe ſuch ſums for purchaſing annuities, exchanging for ready money new exchequer bills, carrying on their trade, &c they might, by ſuch means as they ſhould think proper, raiſe ſuch ſums of money as in a general court of the company ſhould be judged neceſſary. The company were alſo empowered to raiſe money on the contracts, bonds, or obligations under their common ſeal, on the credit of their capital ſtock. But if the ſub-governor, deputy governor, or other members of the company, ſhould purchaſe lands or revenues of the crown upon account of the corporation, or lend money by loan or anticipation on any branch of the revenue, other than ſuch part only on which a credit of loan was granted by parliament, ſuch ſub-governor, or other member of the company, ſhould forfeit treble the value of the money ſo lent.

The fatal South Sea ſcheme, tranſacted in the year 1720, was executed upon the laſt-mentioned ſtatute. The company had at firſt ſet out with good ſucceſs, and the value of their ſtock, for the firſt five years, had riſen faſter than that of any other company; and his majeſty, after purchaſing 10,000l. ſtock, had condeſcended to be their governor. Things were in this ſituation, when, taking advantage of the above ſtatute, the South Sea bubble was projected. The pretence was, to raiſe a fund for carrying on a trade to the South Sea, and purchaſing annuities, &c. paid to the other companies: and propoſals were printed and diſtributed, ſhowing the advantages of this deſign. The ſum neceſſary for carrying it on, together with the profits that were to ariſe from it. were divided into a certain number of ſhares, or ſubſcriptions, to be purchaſed by perſons diſpoſed to adventure therein. And the better to carry on the deception, the directors engaged to make very large dividends: and actually declared that every 100l. original ſtock would yield 50l. per annum; which occaſioned ſo great a riſe of their ſtock, that a ſhare of a 100l. was ſold for upwards of 800l. This was in the month of July; but before the end of September it fell to 150l. by which multitudes were ruined, and ſuch a ſcene of diſtreſs occaſioned, as is ſcarcely to be conceived. But the conſequences of this infamous ſcheme are too well known; moſt of the directors were ſeverely fined, to the loſs of nearly all their property; ſome of them had no hand in the deception, nor gained a farthing by it; but it was agreed, they ought to have oppoſed and prevented it.

The South Sea company never had any forts or garriſons to maintain, and therefore were entirely exempted from one great expence, to which other joint-ſtock companies for foreign trade are ſubject. But they had an immenſe capital divided among an immenſe number of proprietors. It was naturally to be expected, therefore, that folly, negligence, and profuſion, ſhould prevail in the whole management of their affairs.

Their ſtock-jobbing ſpeculations were ſucceeded by mercantile projects, which, Dr Smith obſerves, were not much better conducted. The firſt trade which they engaged in, was that of ſupplying the Spaniſh Weſt Indies with negroes, of which (in conſequence of what was called the Aſſiento contract granted them by the treaty of Utrecht) they had the excluſive privilege. But as it was not expected that much profit could be made by this trade, both the Portugueſe and French companies, who had enjoyed it upon the ſame terms before them, having been ruined by it, they were allowed, as compenſation, to ſend annually a ſhip of a certain burden to trade directly to the Spaniſh Weſt Indies. Of the ten voyages which this annual ſhip was allowed to make, they are ſaid to have gained conſiderably by one, that of the Royal Caroline in 1731, and to have been loſers, more or leſs, by almoſt all the reſt. Their ill ſucceſs was imputed, by their factors and agents, to the extortion and oppreſſion of the Spaniſh government; but was, perhaps, principally owing to the profuſion and depredations of thoſe very factors and agents; ſome of whom are ſaid to have acquired great fortunes even in one year. In 1734, the company petitioned the king, that they might be allowed to diſpoſe of the trade and tonnage of their annual ſhip, on account of the little profit which they made by it, and to accept of ſuch equivalent as they could obtain from the king of Spain.

In 1724, this company had undertaken the whale-fiſhery. Of this, indeed, they had no monopoly; but as long as they carried it on, no other Britiſh ſubjects appear to have engaged in it. Of the eight voyages which their ſhips made to Greenland, they were gainers by one, and loſers by all the reſt. After their eighth and laſt voyage, when they had ſold their ſhips, ſtores, and utenſils, they found that their whole loſs, upon this branch, capital and intereſt included, amounted to upwards of 237,000l.

In 1722, this company petitioned the parliament to be allowed to divide their immenſe capital of more than 33,800,000l. the whole of which had been lent to government, into two equal parts: The one-half, or upwards of 16,900,000l to be put upon the ſame footing with other government annuities, and not to be ſubject to the debts contracted, or loſſes incurred, by the directors of the company, in the proſecution of their mercantile projects; the other half to remain, as before, a trading ſtock, and to be ſubject to thoſe debts and loſſes. The petition was too reaſonable not to be granted. In 1733, they again petitioned the parliament that three-fourths of their trading ſtock might be turned into annuity ſtock, and only one-fourth remain as trading ſtock, or expoſed to the hazards ariſing from the bad management of their directors Both their annuity and trading ſtocks had by this time, been reduced more than 2,000,000l. each, by ſeveral different payments from government; ſo that this fourth amounted only to 3,662,784l. 8s 6d. In 1748, all the demands of the company upon the king of Spain, in conſequence of the Aſſiento contract, were by the treaty of Aix-la-Chapelle, given up for what was ſuppoſed an equivalent. An end was put to their trade with the Spaniſh Weſt Indies, the remainder of their trading ſtock was turned into an annuity ſtock, and the company ceaſed in every reſpect to be a trading company.

This company is under the direction of a governor, ſub-governor, deputy governor, and 21 directors; but no perſon

ſon is qualified to be governor, his majeſty excepted, unleſs ſuch governor has in his own name and right 5000l. in the trading ſtock; the ſub-governor is to have 4000l. the deputy-governor 3000l. and a director 2000l. in the ſame ſtock. In every general court, every member having in his own name and right 500l. in trading ſtock, has one vote; if 2000l. two votes; if 3000l. three votes; and if 5000l. four votes.

2. *The Eaſt India Company.* The firſt, or as it is called the *Old Eaſt India Company*, was eſtabliſhed by a charter from Queen Elizabeth in 1600; but for ſome time the partners ſeem to have traded with ſeparate ſtocks, though only in the ſhips belonging to the whole company. In 1612, they joined their ſtocks into one common capital: and though their charter was not as yet confirmed by act of parliament, it was looked upon in that early period to be ſufficiently valid, and no body ventured to interfere with their trade. At this time their capital amounted to about 740,000l. and the ſhares were as low as 50l.: their trade was in general ſucceſsful, notwithſtanding ſome heavy loſſes, chiefly ſuſtained through the malice of the Dutch Eaſt India Company. In proceſs of time, however, it came to be underſtood that a royal charter could not by itſelf convey an excluſive privelege to traders, and the company was reduced to diſtreſs by reaſon of the multitude of interlopers who carried off the moſt of their trade. This continued during the latter part of the reign of Charles II. the whole of that of James II. and part of William III. when in 1698 a propoſal was made to parliament for advancing the ſum of 2,000,000l. to government, on condition of erecting the ſubſcribers into a new company with excluſive privileges. The old company endeavoured to prevent the appearance of ſuch a formidable rival, by offering government 700,000l. nearly the amount of their capital at that time; but ſuch were the exigencies of the ſtate at that time, that the larger ſum, though at eight per cent. intereſt, was preferred to the ſmaller at one half the expence.

Thus were two Eaſt India Companies erected in the ſame kingdom, which could not but be very prejudicial to each other. Through the negligence of thoſe who prepared the act of parliament alſo, the new company were not obliged to unite in a joint-ſtock. the conſequence of this was, that a few private traders, whoſe ſubſcriptions ſcarce exceeded 7200l. inſiſted on a right of trading ſeparately at their own riſk. Thus a kind of third company was eſtabliſhed; and by their mutual contentions with one another, all the three were brought to the brink of ruin. Upon a ſubſequent occaſion, in 1730, a propoſal was made to parliament for putting the trade under the management of a regulated company, and thus laying it in ſome meaſure open. This, however, was oppoſed by the company, who repreſented in ſtrong terms the miſchiefs likely to ariſe from ſuch a proceeding. "In India (they ſaid), it raiſed the price of goods ſo high, that they were not worth the buying; and in England, by overſtocking the market, it ſunk the price to ſuch a degree that no profit could be made of them." Here Dr Smith remarks, that by a more plentiful ſupply, to the great advantage and conveniency of the public, it muſt have reduced very much the price of India goods in the Engliſh market, cannot well doubted; but that it ſhould have raiſed very much their price in the Indian market, ſeems not very probable, as all the extraordinary demand which that competition could occaſion, muſt have been but as a drop of water in the immenſe ocean of Indian commerce. The increaſe of demand, adds he, though in the beginning it may ſometimes raiſe the price of goods, never fails to lower it in the iſſue. It encourages production, and thereby increaſes the competition of the producers, who, in order to underſell one another, have recourſe to new diviſions of labour and new improvments of art, which might never otherwiſe have been thought of. The miſerable effects of which the company complained, were the cheapneſs of conſumption and the encouragement given to production, preciſely the two effects which it is the buſineſs of political economy to promote. The competition, however, of which they gave this doleful account, had not been allowed to continue long. In 1702 the two companies were, in ſome meaſure, united by an indenture tripartite, to which the queen was the third party; and in 1708, they were, by act of parliament, perfectly conſolidated into one company by their preſent name of "The United Company of Merchants trading to the Eaſt Indies." Into this act it was thought worthy to inſert a clauſe allowing the ſeparate traders to continue their traffic till Michaelmas 1711, but at the ſame time empowering the directors, upon three years notice, to redeem their capital of 7200l. and thereby convert the whole capital of the company into a joint-ſtock. By the ſame act, the capital of the company, in conſequence of a new loan to government, was augmented from 2,000,000l. to 3,200,000l. In 1743, another million was advanced to government. But this being raiſed, not by a call upon the proprietors, but by ſelling annuities and contracting bond-debts, it did not augment the ſtock upon which the proprietors could claim a dividend. Thus, however, their trading ſtock was augmented; it being equally liable with the other 3,200,000l. to the loſſes ſuſtained, and debts contracted, by the company in the proſecution of their mercantile projects. From 1708, or at leaſt from 1711, this company being freed from all competitors, and fully eſtabliſhed in the monopoly of the Engliſh commerce to the Eaſt Indies, carried on a ſucceſsful trade; and from their profits made annually a moderate dividend to their proprietors. Unhappily, however, in a ſhort time, an inclination for war and conqueſt began to take place among their ſervants; which, though it put them in poſſeſſion of extenſive territories and vaſt nominal revenues, yet embarraſſed their affairs in ſuch a manner, that they have not to this day been able to recover themſelves. The particulars of theſe wars are given under the articles BRITAIN, and INDOSTAN. Here it will be ſufficient to obſerve, that they originated during the war in 1741 through the ambition of M. Dupleix the French governor of Pondicherry, who involved the company in the politics and diſputes of the Indian princes. After carrying on hoſtilities for ſome time with various ſucceſs, they at laſt loſt Madras, at that time the principal ſettlement in the Eaſt Indies, but it was reſtored by the treaty of Aix-la-Chapelle. During the war

Smith's Wealth of Nations, vol. iii. p. 134.

of 1755, they acquired the revenues of a rich and extenſive territory, amounting, as was then ſaid, to near 3,000,000l. per annum.

For ſeveral years they remained in quiet poſſeſſion of the revenue ariſing from his territory, though it certainly never anſwered the expectations that had been formed concerning it. But in 1767 the Britiſh miniſtry laid claim to the territorial poſſeſſions of the company, and the revenue ariſing from them, as of right belonging to the crown; and the company, rather than yield up their territories in this manner, agreed to pay government a yearly ſum of 400,000l. They had before this gradually augmented their dividend from about ſix to ten per cent.; that is, on their capital of 3,200,000l. they had raiſed it from 192,000l. to 320,000l. a-year. About this time alſo they were attempting to raiſe it ſtill further, viz. from 10 to 12½ per cent.; but from this they were prevented by two ſucceſſive acts of parliament, the deſign of which was to enable them to make a more ſpeedy payment of their debts, at this time eſtimated at more than ſix or ſeven millions Sterling. In 1769 they renewed their agreement with government for five years more, ſtipulating, that during the courſe of that period they ſhould be allowed gradually to augment their dividend to 12½ per cent.; never increaſing it, however, more than one per cent. annually. Thus their annual payments could only be augmented by 608,000l. beyond what they had been before their late territorial acquiſitions. By accounts from India in the year 1768, this revenue, clear of all deductions and military charges, was ſtated at 2,048,747l. At the ſame time they were ſaid to poſſeſs another revenue, ariſing partly from lands, but chiefly from the cuſtoms eſtabliſhed at their different ſettlements, amounting to about 439,000l. The profits of their trade, too, according to the evidence of their chairman before the houſe of commons, amounted to at leaſt 400,000l. per annum; their accountant made it 500,000l.; and the loweſt account ſtated it at leaſt equal to the higheſt dividend paid to their proprietors. Notwithſtanding this apparent wealth, however, the affairs of the company from this time fell into diſorder; inſomuch that in 1773 their debts were augmented by an arrear to the treaſury in the payment of the 400,000l. ſtipulated; by another to the cuſtomhouſe for duties unpaid; by a large ſum borrowed from the bank; and by bills drawn upon them from India to the amount of more than 1,200,000l. Thus they were not only obliged to reduce their dividend all at once to ſix per cent. but to apply to government for aſſiſtance. A particular account of this tranſaction is given under the article BRITAIN. Here it may be mentioned in general, that the event proved very unfavourable to the company, as they were now ſubjected to an interference of government altogether unknown before. Several important alterations were made in their conſtitution both at home and abroad. The ſettlements of Madras, Bombay, and Calcutta, which had hitherto been entirely independent of one another, were ſubjected to a governor-general, aſſiſted by a council of four aſſeſſors. The nomination of the firſt governor and council, who were to reſide at Calcutta, was aſſumed by parliament; the power of the court of Calcutta, which had gradually extended its juriſdiction over the reſt, was now reduced and confined to the trial of mercantile cauſes, the purpoſe for which it was originally inſtituted. Inſtead of it a new ſupreme court of judicature was eſtabliſhed, conſiſting of a chief juſtice and three judges to be appointed by the crown. Beſides theſe alterations, the ſtock neceſſary to entitle any proprietor to vote at the general courts was raiſed from 500l. to 1000l. To vote on this qualification, too, it was neceſſary that he ſhould have poſſeſſed it, if acquired by his own purchaſe and not by inheritance, for at leaſt one year, inſtead of ſix months, the term requiſite formerly. The court of 24 directors had before been choſen annually; but it was now enacted, that each director ſhould for the future be choſen for four years; ſix of them, however, to go out of office by rotation every year, and not to be capable of being rechoſen at the election of the ſix new directors for the enſuing year. It was expected that, in conſequence of theſe alterations, the courts both of the proprietors and directors would be likely to act with more dignity and ſteadineſs than formerly. But this was far from being the caſe. The company and its ſervants ſhowed the utmoſt indifference about the happineſs or miſery of the people who had the misfortune to be ſubjected to their juriſdiction. This indifference, too, was more likely to be increaſed than diminiſhed by ſome of the new regulations. The houſe of commons, for inſtance, had reſolved, that when the 1,600,000l. lent to the company by government ſhould be paid, and their bond debts reduced to 1,500,000l. they might then, and not till then, divide eight per cent. upon their capital; and that whatever remained of their revenues and nett profits at home ſhould be divided into four parts; three of them to be paid into the exchequer for the uſe of the public, and the fourth to be reſerved as a fund, either for the further reduction of their bond-debts, or for the diſcharge of other contingent exigencies which the company might labour under. But it could ſcarce be expected that, if the company were bad ſtewards and bad ſovereigns when the whole of their nett revenue and profits belonged to themſelves, they would be better when three-fourths of theſe belonged to other people. The regulations of 1773, therefore, did not put an end to the troubles of the company. Among other inſtitutions, it had been at this time enacted, that the preſidency of Bengal ſhould have a ſuperiority over the other preſidencies in the country; the ſalary of the chief juſtice was fixed at 8000l. per annum, and thoſe of the other judges at 6000l. each. In conſequence of this act, Sir Elijah Impey, who was created a baronet on the occaſion, ſet ſail, with three other judges, for India, in the year 1774. The powers with which they were inveſted were very extraordinary. They had the title of His Majeſty's Supreme Court of Judicature in India. Civil law, common law, eccleſiaſtical, criminal, and admiralty juriſdiction, belonged of right to them. They were empowered to try Europeans on perſonal actions, and to aſſeſs damages, without a jury. Every native, either directly or indirectly in the ſervice of the company, or in their territories, was made ſubject to their juriſdiction, with a view to prevent the Europeans from eluding juſtice under the pretence of employing

ploying natives in the commiſſion of their crimes ; ſo that in fact they were abſolute lords and ſovereigns of the whole country.

Such exceſſive and unlimited powers conferred on any ſmall number of men, could not but be extremely diſagreeable to the Europeans, who had been accuſtomed to enjoy a liberty almoſt equally unbounded before; nor was it to be ſuppoſed that the judges, thus ſuddenly raiſed from the rank of ſubjects to the height of deſpotiſm, would always uſe their power in an unexceptionable manner. The deſign of the eſtabliſhment was to preſerve the commerce and revenues of the company from depredation; by ſubjecting its ſervants to the controul of the court ; to relieve the ſubject from oppreſſion by facilitating the means of redreſs ; and to fix a regular courſe of juſtice for the ſecurity of liberty and property. Inſtead of conſidering the circumſtances of the country, however, or the manners and cuſtoms of the natives, the judges now precipitately introduced the Britiſh laws in their full extent, without the leaſt modification to render them agreeable to the Aſiatics, who had been accuſtomed to others of a quite different nature ; nor did they even pay the leaſt regard to the religious inſtitutions or habits to which the Indians are ſo obſtinately attached, that they would ſooner part with life itſelf than break through an article of them.

Beſides this it was ſaid, that, on the firſt arrival of the judges, they endeavoured to extend their authority beyond even what the Britiſh legiſlature had allowed them. Hence they were frequently at variance with the council; and complaints of their conduct were repeatedly ſent to England by the ſervants of the company. Theſe produced a letter in 1777 from the directors to Lord Weymouth, ſecretary of ſtate for the ſouthern department. In this they ſtated, that the ſupreme court of India had extended its juriſdiction to thoſe whom it did not appear to have been the intention of the king or parliament to ſubject to its authority. It had alſo taken cognizance of matters which, they apprehended, belonged properly to other courts. That the judges conſidered the criminal law of England as in force, and binding on the natives of Bengal, though utterly repugnant to the laws and cuſtoms by which they had hitherto been governed ; and that the juriſdiction exerciſed by the ſupreme court was incompatible with the powers given by parliament to the governor-general and council, obſtructed the adminiſtration of goverment, and tended to alienate the minds of the natives ; all which they feared would prevent the eſtabliſhment of the government of India upon any ſettled or permanent foundation.

This letter not having produced any effect, the diſcontents of India, both in the Europeans and natives, continued and increaſed. The deciſions of the judges were ſuch as by no means did them honour A number of adventurers had alſo emigrated along with them, in hopes of enriching themſelves under the new conſtitution. Some of theſe were of the loweſt ſort of people, who had rendered it in a manner impoſſible for them to remain in England on account of their vices or extravagance. Many ſuch perſons had enrolled themſelves among the domeſtics of the judges, or had become their immediate dependents ; and ſome of theſe were permitted to aſſume the characters of attorneys, court-officers, under-ſheriffs, and bailiffs. It may eaſily be ſuppoſed, that people of ſuch characters would find it for their intereſt to promote ſuits in the ſupreme court : and in this ſome of them employed themſelves with great ſucceſs. The conſequence of all this was, that on the 4th of December 1780, a petition was preſented againſt the ſupreme court by a great number of Britiſh inhabitants in the kingdom of Bengal, Bahar, and Orixa. In this, complaint was made of the indiſcriminate manner in which the judges of the ſupreme court attempted to exerciſe the Engliſh laws in that country, at the ſame time that they refuſed the undoubted right of every Britiſh ſubject, viz. that of trial by jury. They intreated the houſe " to reflect on the innumerable hardſhips which muſt enſue, and the univerſal confuſion which muſt be occaſioned, by giving to the voluminous laws of England a boundleſs retroſpective power in the midſt of Aſia, and by an application of thoſe laws, made for the freeſt and moſt enlightened people on earth, the principle of whoſe conſtitution was founded on virtue and liberty, to tranſactions with the natives of India, who had, from time immemorial, lived under a deſpotic government, founded on fear and reſtraint. What muſt be the terrors of individuals to find their titles to property, and their tranſactions with the natives previous to the eſtabliſhment of this court of judicature, tried by the ſtandard of the Engliſh law, and by men educated under its forms, and unavoidably imbibing its prejudices, when no ſuch laws could be known to or practiſed by natives or Europeans then reſiding in the country, and that at a time when there were few perſons of legal knowledge in the country to adviſe or aſſiſt them ? No tyranny could be more fatal in its conſequences, than that a court, inveſted with all the authority of one of the firſt courts in England, ſhould alſo poſſeſs undefined powers and juriſdiction, of which its judges were the ſole interpreters. and at ſuch an immenſe diſtance from the mother country. This was in truth the ſituation of the Britiſh ſubjects in India at that time ; for the judges of the ſupreme court could at pleaſure determine on the denomination of a civil jury, the degree of guilt incurred by any offence, the ſtatute by which it ſhould be tried, what penalties ſhould be inflicted, as well as who were and who were not amenable to the juriſdiction of the court.

" Beſides their other powers alſo, the judges of the ſupreme court were allowed to ſit as a court of chancery, and in that capacity to reviſe, correct, reſcind, or confirm the deciſions paſſed by themſelves as a court of law ; and by another part of their conſtitution, they were allowed to ſtop execution in criminal caſes until his majeſty's pleaſure was known. The petitioners conceived, that there muſt be ſome fundamental error in that conſtitution, which required a more than ordinary degree of temper, integrity, and ability, to carry its purpoſes into execution ; and they did not heſitate to declare, that to adminiſter the powers appertaining to the inſtitution of the ſupreme court, without committing flagrant acts of injuſtice, and doing great detriment to the public, required more equity, moderation, diſcernment, and enlightened abilities, then they could hope to find in any ſet of men." They concluded with earneſtly ſoliciting parliament, that a trial by jury might be granted to the Britiſh ſubjects in Bengal, in all caſes where it was eſtabliſhed by law in England; that the retroſpective powers of the ſupreme court might be limited to the time of its eſtabliſhment in Bengal; that it ſhould be defined beyond the power of diſcretional diſtinction who the perſons were that properly came under the juriſdiction of the court, and who did not; that it ſhould be expreſsly declared what ſtatutes ſhould, and what ſhould not, be in force in Bengal; that diſtinct and ſeperate judges for the law and equity ſides of the court ſhould be appointed; and that a power of delaying executions in criminal caſes until his majeſty's pleaſure was known, ſhould be lodged in the governor and council.

This petition was ſoon followed by another ſigned by Warren Haſtings, Eſq. governor-general, Philip Francis and Edward Wheeler, Eſqs. counſellors for the government and preſidency of Fort-William in Bengal; in which they repreſented, "that, though the juriſdiction of the ſupreme court of judicature at Calcutta, as well as the powers granted to the governor-general and council, were clearly limited by parliament and the king's letters patent, yet the chief juſtice and judges of that court had exerciſed authority over perſons not legally within their juriſdiction, and had illegally and improperly adviſed and admitted ſuits againſt the governor-general and council: that they had attempted to execute their writs upon natives of high rank in the kingdom of Bengal, who were not within their juriſdiction: the governor and council therefore had found themſelves under a neceſſity of oppoſing them, and of affording protection to the country and people, who were placed under their own immediate inſpection, and freeing them from the terrors of a new and uſurped dominion. They had even been obliged to make uſe of a military force, in order to reſiſt the proceedings of the judges and their officers: And they declared, that no other conduct could have ſaved thoſe provinces and the intereſts of the company, or of the Britiſh nation itſelf, from the ruin with which they were threatened. They alſo declared themſelves to be of opinion, that the attempt to extend, to the inhabitants of theſe provinces, the juriſdiction of the ſupreme court of judicature, and the authority of the Engliſh law, which were ſtill more intolerable than the law itſelf, would be ſuch a reſtraint on the minds of the people of thoſe provinces, by the difference of ſuch laws and forms from their laws, that they might at laſt inflame them, notwithſtanding their known mildneſs and patience, into an open rebellion." The petition was concluded, by ſoliciting an indemnity from the legal conſequences of the reſiſtance they had been obliged to make to that court.

While the Britiſh were thus expreſſing their diſpleaſure againſt the conduct of theſe judges, the natives were thrown into the utmoſt conſternation and deſpair by the acts of oppreſſion and violence committed by them. A proſecution for forgery had been commenced againſt Nundcomar, a bramin of the firſt rank in Bengal. The crime was not capital by the laws of Indoſtan, and had been committed many years before; yet with the utmoſt cruelty and injuſtice was this man condemned and executed on the Britiſh ſtatute, by which forgery is made capital: a ſtatute which, at the commiſſion of the crime, he had never heard of, nor could ever dream that he would be ſubjected to its power. What rendered this execution the more remarkable was, that, at the very time when the charge of forgery was brought againſt him, Nundcomar had been employed in exhibiting an accuſation againſt Mr Haſtings. This, together with the hurry in which the court were to have him put to death (for the court refuſed to allow him a reſpite till his majeſty's pleaſure was known,) made the natives conclude that he was executed, not on account of the forgery, but for having ventured to prefer an accuſation againſt an Engliſh governor. In other reſpects they were terrified to ſuch a degree, that many of them ran into the river on ſeeing a bramin put to death with ſuch circumſtances of ignominy.

The alarm excited by the execution of Nundcomar was kept up by freſh deciſions of the ſupreme court. Among thoſe the Patna cauſe, as it is commonly called, was one of the moſt remarkable. An adventurer, named Shahaz Beg Cawn, had come from Cabul in Perſia to Bengal, where he entered himſelf in the ſervice of the company, and was preferred to the command of a body of horſe. Having gained a competent fortune, and obtained from the Mogul a grant of lands called an *Ultumghaw* in the province of Bahar, he retired from the army, and ſettled in Patna. About this time, when advanced in years, he married a woman of low rank, named *Nadara Begum*, by whom he had no children. His brother, Allum Beg, came likewiſe to Patna; and on his leaving the place ſome time after, committed the care of one of his ſons, named *Behader Beg*, to his brother Shahaz Beg Cawn. On the death of the latter in 1776, a diſpute enſued concerning the inheritance betwixt the widow and Behader Beg. The widow having taken poſſeſſion of the whole property of Shahaz, the nephew, as adopted ſon and heir, gave in a petition to the provincial council at Patna, on the 2d of January 1777, ſetting forth his claim. In this petition he ſtated, that the widow was removing and ſecreting the effects of the deceaſed; and concluded with a prayer, that orders ſhould be given to prevent their removal; to recover ſuch as had already been carried away; and that the cadi or Indian judge ſhould be directed to aſcertain his right. As the parties were Mahometans, the council of courſe referred the cauſe to the cadi and two mufties, the proper officers for determining it according to the eſtabliſhed laws of the country. Theſe having inquired into the matter, reported, that the title-deeds, on which the widow pretended to found her right, appeared to be forged; and that, even if they had appeared in the life-time of Shahaz, they were ſtill informal, on account of a point of the Mahometan law, which requires, that to make deeds of gift valid, poſſeſſion ſhould be entered into at the time of executing or delivering them over; but that, as no poſſeſſion of this kind had been given, the eſtate ought to be divided according to the Mahometan law; viz. one-fourth to the wife, and three-fourths to the nephew, as the repreſentative of his father Allum Beg, who was conſidered as the more immediate heir of the deceaſed. This deciſion was confirmed by the council of Patna, with the following exception in favour of the widow, that the heir at-law ſhould pay her one-fourth of the rents of the ultumghaw, or royal grant, for her ſupport during life. The widow, however, refuſed to ſubmit to the deciſion, or to deliver up the effects of her huſband; in conſequence of which compulſatory methods were uſed; when by the advice of ſome Engliſh lawyers, an action of treſpaſs was broǝght, according to the law of England, againſt the cadi and two mufties for their proceedings againſt her, laying the damages at about 66,000l. ſterling. This proceſs being brought before the ſupreme court, was by them conducted in ſuch a manner as muſt entail everlaſting infamy on the actors. They began with obliging the cadi and mufties to find bail in no leſs than 40,000 pounds for their appearance, which was immediately given by the council at Patna. The ſupreme court then having entered into the merits of the cauſe, and decided the matter in the moſt rigorous manner, according to all the forms of Engliſh law, aſſeſſed the cadi and mufties in damages no leſs than 30,000l. ſterling. Their houſes and effects were ſeized by the ſheriff's officers, and publicly put up to ſale; the cadi, who was upwards of 60 years of age, and had been in office for many years with great applauſe, died on his way to the common gaol at Calcutta, to which the nephew and two mufties were conveyed, being a diſtance of no leſs than 400 miles from their former reſidence at Patna. A ſuit, however, was commenced againſt the widow, on account of having forged the title-deeds by which ſhe claimed her huſband's eſtate; but it was ſuppreſſed on account of ſome informality.

Another deciſion, by which the ſupreme court likewiſe incurred much cenſure, was that againſt Jaggernaut, the principal public officer of a Mahometan court at Dacca. The action was brought at the inſtigation of an Engliſh attorney, in behalf of one Khyne, a ſervant or meſſenger, who had been fined and impriſoned for a miſdemeanor, in which Jaggernaut had concurred in virtue of his office as judge of the Nizamut (the name of the Mahometan court juſt mentioned). The ſheriff-officers attempted to arreſt the judge as he ſat on the tribunal; which could not fail to produce much diſturbance. Jaggernaut, with his officers, denied the authority of the ſupreme court over the Nizamut, and refuſed to comply with the writ. The Engliſh ſheriff-officers proceeded to force; and a violent ſcuffle enſuing, Jaggernaut's father was wounded in the head with a ſword by one of the under-ſheriff's attendants, while his brother-in-law was very dangerouſly wounded with a piſtol bullet by the under-ſheriff himſelf. The immediate conſequence of this was an abſolute refuſal of the judge to take cognizance of any criminal matters; and this was intimated in a letter from the council at Dacca to the Engliſh governor and council of India; wherein they declared that all criminal juſtice was at a ſtand.

The ſupreme court, having proceeded in this arbitrary and oppreſſive manner for ſome time, at length attempted to extend their juriſdiction over the hereditary zemindars of Bengal. Theſe are a kind of tributary lords, or great landholders, who are anſwerable to the company for the revenues or rents of the diſtricts; and excepting the circumſtances of remitting their revenues to the company, have not the leaſt connection with the Engliſh in any reſpect. At the time we ſpeak of, however, a writ upon an action of debt was iſſued out to arreſt one of theſe zemindars in his palace. Timely notice, however, was given, by one of the company's collectors, of this attempt to the governor and council, and application made to protect a man of ſuch quality from the diſgrace of an arreſt. They being unanimouſly of opinion that the zemindar was not within the juriſdiction of the court of Calcutta, deſired him to pay no regard to the writ. The court, however, determined to enforce their proceſs by a writ of ſequeſtration; upon which the natives, who are ſuperſtitiouſly attached to their zemindars, roſe in his defence, and inſulted the ſheriff's officers. The latter having obtained a reinforcement, the zemindar's palace was entered by 86 men armed with bludgeons, cutlaſſes, and muſkets; the apartment of his women, always held inviolably ſacred by the Aſiatics, was broken open; his temple profaned; and the image, which was the object of his worſhip, put into a baſket, and carried off with ſome common lumber. This rouſed the attention of the governor and council; who, from a full conviction of the ruinous tendency of theſe proceedings, determined at laſt to oppoſe it force by force. They accordingly ſent a party of military to apprehend the ſheriff's people, and they were all conducted priſoners to Calcutta. The judges ordered attachments againſt the officer who commanded the troops, and againſt two other ſervants of the company; while the governor and council endeavoured to juſtify their proceedings, by writing to England as already mentioned.

Beſides all this, the natives themſelves teſtified their diſapprobation of the conduct of the ſupreme court in very ſtrong terms. A petition to his Britannic majeſty was ſent by the natives of Patna; in which are the following remarkable paſſages: "When the ordinances of this court of judicature were iſſued, as they were all contrary to the cuſtoms, modes, uſages, and inſtitutions, of this country, they occaſioned terror in us; and day by day, as the powers of this court have become more eſtabliſhed, our ruin, uneaſineſs, diſhonour, and diſcredit, have accumulated; till at laſt we are reduced to ſuch a ſituation, that we conſider death to us as infinitely preferable to the dread we entertain of the court: for from this court no credit, no character is left to us, and we are now driven to the laſt extremity. Several who poſſeſſed means and ability deeming flight as their only ſecurity, have baniſhed themſelves from the country; but bound as we are by poverty and inability, and fettered by the deareſt ties of conſanguinity, we do not all of us poſſeſs the means of flight, nor have we power to abide the oppreſſion of this court."—"If, which God forbid! it ſhould ſo happen, that this our petition ſhould not be accepted, and ſhould be rejected at the chamber of audience, thoſe amongſt us who have power and ability, diſcarding all affection for our families, will fly to any quarter we can; whilſt the remainder, who have no means or ability, giving themſelves up with pious reſignation to their fate, will ſit down in expectation of death."

Theſe repeated complaints could not but be taken notice of in parliament. On the 12th of February 1781, General Smith made a motion in the houſe of commons, that the petition from the Britiſh inhabitants of Bengal, Bahar, and Oriſſa, ſhould be taken into conſideration by a ſelect committee, conſiſting of 15 perſons, choſen by ballot. In the introduction to his motion, he ſtated briefly the bad conduct of the ſupreme court in the particulars already related; and concluded, that the affairs of Bengal required the immediate attention and conſideration of parliament. The matter was accordingly debated; when, after various propoſals, a motion was at length made by General Smith, for leave to bring in a bill "to explain and amend ſo much of an act paſſed in the 13th year of his preſent majeſty, for the better regulation of the Eaſt India company, as related to the adminiſtration of juſtice in Bengal; and alſo to indemnify the governor and council of Bengal for having reſiſted by force of arms the execution of an order of the ſupreme court of judicature in that kingdom." Leave was accordingly given to bring in the bill. The houſe having reſolved itſelf into a committee, Lord North obſerved, "that it had been much his wiſh that an agreement for the renewal of the company's charter had been made in an amicable manner; and that voluntary propoſitions ſhould have come from themſelves, offering terms for the benefit of the excluſive trade and the territorial acquiſitions. No ſuch terms, however, had been propoſed, nor any agreement made. A negociation had indeed taken place between him and the chairman and deputy-chairman; but the propoſitions made by them were neither ſuch as the public might expect, nor had the company any right to them. With regard to the territorial poſſeſſions, he was clearly of opinion, that they of right belonged to the public; though how far it might be proper to allow the revenue of them to remain in the poſſeſſion of the company was quite another matter. In his opinion, it would be proper to allow it to remain in their hands as long as they poſſeſſed an excluſive trade, but he never would conſent to forego the claim of the public. He made a motion, therefore, "that it was the opinion of the committee, that three-fourths of the ſurplus of the nett profits of the Eaſt India Company, ever ſince the company's bond debt was reduced to 1,500,000l. and the company's dividends had been eight per cent. per annum, belong to the public; and that 600,000l. in lieu thereof, and in diſcharge of all claims on that part of the public, be paid into his majeſty's exchequer by inſtalments, in ſuch manner and at ſuch times, as ſhall be agreed on." This propoſal was vehemently oppoſed by the minority. Mr Burke called it the daring effort of a miniſter determined on rapine and plunder, without regard to truth, honour, or juſtice. Mr Huſſey reprobated the idea of taking 600,000l. from the company in their circumſtances at that time. He produced a paper full of arithmetical calculations, which he read to the houſe; aſſerting that they contained an exact ſtate of the amount of the company's exports and imports, the expences of their trade at home, and the balance of profit of each year, for many years paſt, diſtinguiſhing the territorial from the commercial income and expences. From theſe he ſhowed, that the commercial and territorial revenues of the company had, upon an average for 16 years, conſtituted a ſum equivalent to a proportion of 16 per cent.; that 9 per cent. of this had ariſen from the commercial profits accruing to the company; and therefore, that there had not been 8 per cent. divided upon that part of the profits to which the public had any claim or pretenſion. The acceſſion of territorial poſſeſſions, he obſerved, had brought along with it additional expences; and the public had already received a very large ſhare of the company's profits. He declared it to be his opinion, that the company ſhould always make it a rule to give as ample and full relief to the public burdens as their ſituation would allow; and if they did this, he ſaw no reaſon why the miniſter ſhould exact any more. Mr Dempſter reminded the houſe of the conſequences of violating the American charters; and added, that to tear from the company by force what was not ſtipulated in any act of parliament, would be a breach of public faith diſgraceful to the nation, and ſuch as would damp the ſpirit of enterpriſe and adventure, which had been productive of ſuch happy effects.—Notwithſtanding theſe remonſtrances, however, the bill was at laſt paſſed into a law; only with this mitigation, that the company ſhould pay only 400,000l. inſtead of 600,000l. demanded originally by the miniſter.—Another bill was alſo paſſed the ſame year, in conſequence of the motion made by General Smith. This act declared, that the governor-general and council of Bengal were not ſubject to the juriſdiction of the ſupreme court, and indemnified the former for the reſiſtance they had made to the orders of that court. It enacted alſo, that no perſon ſhould be ſubject to the juriſdiction of that court on account of his being a landholder or farmer of land in the provinces of Bengal, Bahar, or Oriſſa; that no judicial officers in the country courts ſhould be liable to actions in the ſupreme court for their deciſions; and the two mufties, with Behader Beg, who were then in priſon, in conſequence of the deciſion of that court in the Patna cauſe, were ordered to be ſet at liberty.

The debates on this ſubject were attended with the moſt violent charges againſt the miniſter, and aſſertions the moſt humiliating and diſgraceful to the Britiſh nation. Mr Townſhend affirmed, that it was from the miniſter's ſcreening the dilinquents who came from India that all the evils in that quarter had originated; and if matters were ſuffered to go on in that country as they had done for ſome time paſt, the conduct of the Britiſh in the Eaſt Indies muſt be viewed in a light ſtill more deteſtable than that of the Spaniards in America. It was reported, that the nabob of Arcot had ſeveral members in the houſe of commons! If it were true, that by ſending over a ſum of money to England he could ſeat eight or ten members in that houſe, then Mr Townſhend declared, that in his opinion they were the moſt abject and contemptible beings in the world.—The bill for regulating the powers of the ſupreme court, alſo, though ſo evidently founded in reaſon and juſtice, did not paſs without oppoſition, particularly from Mr Dunning; who was thought on this occaſion to have allowed his regard for his friend Sir Elijah Impey, the chief juſtice, to bias him too much.

The regulations juſt mentioned did not yet put an end to the troubles of the Eaſt India company, nor allay the ferment which had been ſo effectually excited. Their affairs were ſtill a ſubject of parliamentary diſcuſſion; and in the month of April 1782, a motion was made by Mr Dundas, then lord advocate of Scotland, for taking into conſideration the ſeveral reports concerning affairs, which had been made by the ſecret committee appointed to inquire into them during the laſt and preſent ſeſſion of parliament. In his ſpeech on this occaſion, he remarked, that the opinion of Lord Clive had been againſt keeping too extenſive a territory in that country. Inſtead of this, he had reſtored Sujah Dowlah to the poſſeſſion of his country; conſidering the Britiſh territories in Hindoſtan, with thoſe on the coaſts of Coromandel and Bombay, as ſufficient for all the purpoſes by which this country could be benefited; but inſtead of adhering to the maxims of ſound policy laid down by his lordſhip, they had become ſo ambitious of extending their territories, that they had involved themſelves in a war with almoſt all India. He then conſidered the finances of the company. The revenue of Bombay, he ſaid, fell ſhort of the neceſſary civil and military eſtabliſhment by 200,000l. a-year, which was annually drawn from Bengal. With regard to that of Madras, it appeared, on an average of 12 years, from 1767 to 1779, that there had been eight years of war and only four of peace; and that, during the whole time of war, the revenue had not been able to ſupport the civil and military eſtabliſhments; though, in time of peace, it was able to do nearly one-half more. Bengal, however, was the moſt lucrative of all the Eaſt India ſettlements; but ſuch had been the expences of the Mahratta war, that the governor-general had been obliged to contract a very large debt, inſomuch, that it was doubtful whether the inveſtments for England ſhould be wholly or partially ſuſpended. Mr Haſtings, he ſaid, had in many inſtances proved himſelf a very meritorious ſervant: but he wiſhed that every one of their ſervants would conſider himſelf as bound in the firſt place to prove a faithful ſteward to the company; not to fancy that he was an Alexander or Aurengzebe, and prefer frantic military exploits to the improvement of the trade and commerce of his country.—General Smith obſerved, that by the evidence produced to the committee, it appeared that there had been a variety of great abuſes in India. Sir Elijah Impey, his majeſty's chief juſtice in that country, had ſo far derogated from the character of a judge, as to accept of a place from the company; by which means he was brought under their controul, and conſequently allowed himſelf to be deprived of that independency which he ought to poſſeſs as a judge. Juſtice had been ſo partially adminiſtered, that ſeveral worthy and reſpectable perſons had been impriſoned, ſome had been ruined, and others died in jail. From all which conſiderations he moved, that the affairs of the company ought to be taken into conſideration by a committee of the whole houſe. Some hints were thrown out by Mr Dundas, that the territorial poſſeſſions in the Eaſt ought to be taken from the company entirely, and put under the direction of the crown; but this was oppoſed by Mr Fox, as furniſhing miniſters with ſuch ample means of corruption and undue influence, as might overthrow the conſtitution entirely. For this reaſon, he thought it would be more prudent to leave the appointment of its own ſervants to the company; but at the ſame time to keep a watchful eye over them, in order to be able to puniſh and remove thoſe who ſhould be found delinquent.

The houſe having reſolved itſelf into a committee, a motion was made by General Smith, "That Warren Haſtings, Eſq; governor-general of Bengal, and Sir Elijah Impey, the chief juſtice, appear to have been concerned, the one in giving, the other in receiving, an office not agreeable to the late act for regulating the company's affairs; which unjuſtifiable tranſaction was attended with circumſtances of evil tendency and example." Reſolutions were alſo paſſed for aſcertaining more diſtinctly the powers of the governor-general and council of Bengal; and votes of cenſure againſt Laurence Sullivan, Eſq. chairman of the Eaſt India Company, for having neglected to tranſmit to India an act for explaining and amending the act for regulating the affairs of the company, and for the relief of certain perſons impriſoned at Calcutta. Among the number of this gentleman's tranſgreſſions, alſo, was his impoſing an oath of ſecrecy on Mr Wilkes, one of the company's clerks; and eſpecially his reſtraining him from giving information to a ſelect committee of the houſe of commons.

Mr Dundas having made ſeveral motions tending to criminate Sir Thomas Rumbold, formerly governor of Bengal, a bill was brought in, and paſſed into a law, for reſtraining him and Peter Perring, Eſq. from going out of the kingdom for the ſpace of one year, for diſcovering their eſtates, &c. An addreſs was alſo preſented to the king, requeſting him to recal Sir Elijah Impey from India, in order to anſwer for high crimes and miſdemeanours. A number of other reſolutions were now paſſed by the houſe, in conſequence of motions by Mr Dundas, and which were founded on the reports of the ſecret committee. Among theſe it was reſolved, "That the orders of the court of directors of the Eaſt India Company, which have conveyed to their ſervants abroad a prohibitory condemnation of all ſchemes of conqueſt and enlargement of dominion, by preſcribing certain rules and boundaries for the operation of their military force, were founded no leſs in wiſdom and policy than in juſtice and moderation. That every tranſgreſſion of theſe orders, without evident neceſſity, by any of the ſeveral governments in India, has been highly reprehenſible, and tended in a great degree to weaken the force and influence, and to diminiſh the influence of the company in thoſe parts. That every interference of the company as a party in the domeſtic or national quarrels of the country powers, and all new engagements with them in offenſive alliance, have been wiſely and providentially forbidden by the company in their commands to their adminiſtrations in India. That every unneceſſary deviation from theſe rules ſhould be ſeverely reproved and puniſhed. That the maintenance of an inviolable character for moderation, good faith, and ſcrupulous regard to treaty, ought to have been the ſimple grounds on which the Britiſh government ſhould have endeavoured to eſtabliſh an extenſive influence, ſuperior to that of other Europeans; and that the danger and diſcredit ariſing from the forfeiture of this pre-eminence, could not be compenſated by the temporary ſucceſs of any plan of violence and injuſtice. That ſhould any relaxation take place, without ſufficient cauſe, in theſe principles of good government on the part of the directors themſelves, it would bring upon them, in a heavier degree, the reſentment of the legiſlative power of their country. That the conduct of the company, and their ſervants in India, in various inſtances ſpecified, was contrary to policy and good faith ; the company's ſervants, in their preſidency of Bombay, had been guilty of notorious inſtances of diſobedience to the orders of their employers, particularly in forming an alliance with Ragobah, or Ragonaut Row : that they had undertaken, without any adequate military force, or certainty of a ſufficient revenue, and without proper communication with the ſuperior government upon which they were to depend for ſanction and ſupport, to reinſtate the uſurper above mentioned, and thereby to involve themſelves in a war with the ruling miniſters of the Mahratta ſtate, while Ragobah himſelf was not in the mean time able to give the company any ſecure poſſeſſion of the grants he had made to them for the purchaſe of their aſſiſtance. That it was the opinion of the houſe, that all the diſaſters in which the Britiſh empire in the Eaſt was involved had proceeded from the unjuſtifiable manner in which the Mahrattas had been treated, and the conduct of the Madras preſidency in other reſpects ſpecified. That it is the opinion of this houſe, that it muſt be reckoned among the additional miſchiefs ariſing chiefly from the improvident war with the Mahrattas, that the military force of the Carnatic had been weakened by reinforcements ſent to the Malabar coaſt : that the Bengal government had been under a neceſſity of ſupporting, on their confines, the army of a power confederated againſt them (A) : that they had been under the neceſſity of ſuing for the mediation of the ſame power ; and ſubmitted to a refuſal, and purchaſed at laſt an uncertain, becauſe apparently an unauthoriſed, treaty, on moſt extravagant and diſhonourable conditions, with Chimnagee the rajah of Berar's ſon : and, finally, that being burdened with the expences of a variety of diſtant expeditions, while their allies were in diſtreſs, and their tributaries under oppreſſion, there was alſo an alarming deficiency in the reſources of revenue and commerce, by the accumulation of their debt, and the reduction of their inveſtment. That it was the opinion of the houſe, that an attempt made by the governor-general, in the beginning of January 1781, to form an engagement of alliance, offenſive and defenſive, with the Dutch Eaſt India Company, in the manner ſtated by the proceedings of their council, was unwarranted, impolitic, extravagant, and unjuſt.

Theſe ſevere cenſures extended even to the directors themſelves, whoſe conduct on ſome occaſions was declared to be indefenſible, as well as that of their ſervants and agents. It was alſo reſolved, "That Warren Haſtings, Eſq. governor-general of Bengal, and William Hornſby, Eſq. preſident of the council of Bombay, having in ſundry inſtances acted in a manner repugnant to the honour and policy of this nation, and thereby brought great calamities on India, and enormous expences on the India company, it was the duty of the directors to purſue all legal and effectual means for the removal of the ſaid governor-general and preſident from their offices, and to recal them to Britain."

The commons having thus ſeriouſly entered into a conſideration of Eaſt India affairs, ſoon found ſtill more abundant reaſon for cenſure. It was diſcovered, that corruption, fraud, and injuſtice, had pervaded every department. It had become an object with the ſervants of the company to oppreſs the natives by every poſſible method. They monopolized every article of trade, and ſeemed to have no other principle of commerce but lawleſs violence : the court of directors ſent out inſtructions; but for the moſt part without any effect. Though the delegated adminiſtration of India ought to have preſerved the ſtricteſt obedience to that of Britain; yet, being at ſo great a diſtance from the ſeat of ſupreme authority, and being poſſeſſed of endleſs means of abuſe, it had become corrupt in an extreme degree. Inſtead of being ſubſervient to government at home, the adminiſtration of India affected independence. The maxims of Mr Haſtings were arbitrary; and he ſeemed to have no inclination to obey. He treated with ſovereign contempt the authority of the court of directors : and the confuſion produced by the diſputes between them were foſtered by the body of India proprietors, who were diſpoſed to act as a check upon the directors. The neceſſity of new regulations in the government of India was univerſally admitted; and a bill for this purpoſe was accordingly brought in by Mr Dundas. His propoſitions were, that the governor and council of Bengal ſhould have a controuling power and juriſdiction over the inferior preſidencies of India; and he was of opinion that the governor-general ſhould be inveſted with a power to act even againſt the will and opinion of the council, whenever he ſhould imagine that, by ſo doing, he could contribute to the public good; though, in theſe caſes, he alone ſhould be reſponſible for the event. With regard to the inferior governors, though he did not think it proper that they ſhould be authoriſed to act contrary to the advice of the council, he was of opinion, that they ought to have a right of negativing every propoſition, until application was made to the governor-general and council of Bengal. With regard to the zemindaries, and other tenures of land, he obſerved, that when Hindoſtan had been conquered by the Moguls, a tribute was impoſed upon the zemindars ; and while they continued to pay this tribute, they accounted themſelves to be the real proprietors and maſters of the lands they poſſeſſed. The people called *ryots*, to whom theſe zemindaries were lent out, conſidered themſelves likewiſe as ſecure in their poſſeſſions while they performed the articles of their reſpective contracts. Of late, however, theſe rights had been infringed ; and the Mogul came to conſider himſelf as the abſolute maſter of all the ſoil of Indoſtan; which maxim he was inclined to deſtroy, and erect upon it another, that might ſecure the landholders in their property. He propoſed to ſecure the nabob of Arcot and rajah of Tanjore in their territories, by making an act of parliament in favour of the latter; but was of opinion, that the debts of theſe princes ought not to be too nicely inquired into, as the greateſt part of them originated in corruption. He was clearly of opinion, however, that Governor Haſtings ought to be recalled;

(A) The power here alluded to was Movdajee Booſla, rajah of Berar. See INDOSTAN.

ed; and that ſteps ought to be taken to prevent the court of proprietors from preſuming to act in contradiction to parliament. Lord Cornwallis appeared to be the moſt proper ſucceſſor to Mr Haſtings. His perſonal honour, and that of his anceſtors, were pledges for his good behaviour; and being independent in his fortune, he could have no veiw of repairing his eſtate out of the ſpoils of India; and from his profeſſion, he could add to the character of governor that of commander in chief; he would not, however, inſiſt on his name being filled up in the bill, as that would reſt more properly with government.

Mr Haſtings was defended by Governor Johnſtone, who endeavoured to ridicule the arguments and propoſals of Mr Dundas. He obſerved, to the honour of the former, that he had been able to conclude a peace with the Mahrattas; and while he enlarged on his talents for negociation, he admired the reſources with which he had ſupplied the expences of the war. It ought to be conſidered, that Mr Haſtings was in a ſituation the moſt difficult, and that no man could have ſuſtained it with more fortitude and ability. His enemies had dealt in inſinuation and invective; but when the hour of trial came, they would find that their charges would be refuted with equal eaſe. He was defended alſo by Mr Dempſter, who adviſed the houſe ſeriouſly to think before they paſſed a vote for the removal of Mr Haſtings. His exertions had been extraordinary; and it would then be as ridiculous to ſuperſede him, as it would have been to recal General Elliot, when the Spaniſh batteries were playing againſt Gibraltar. He was not, however, an advocate for all the meaſures of Mr Haſtings; his errors might be numerous; but no cenſure of him ſhould be eſtabliſhed before they were pointed out and explained.

Mr Dundas having now obtained leave to bring in his bill, another was moved for by Sir Henry Fletcher, "That leave be given to bring in a bill to diſcharge and indemnify the united company of merchants trading to the Eaſt Indies, from all damages, intereſt, and loſſes, in reſpect to their not making regular payment of certain ſums due to the public, and to allow farther time to ſuch payment; to enable the company alſo to borrow a certain ſum of money, and to make a dividend for the proprietors of four per cent. at midſummer 1783." He endeavoured to ſhow, that the public had derived very conſiderable advantages from the company; that their dividend had been 8l. 4s. annually during the time of peace, and 7l. 15s. per cent. during war; they were by no means in a ſtate of inſolvency, as ſome members had endeavoured to prove, their preſent application proceeding only from a temporary embarraſſment. A new diſpute took place concerning Mr Haſtings, who was warmly attacked by Mr Burke, and defended by Governor Johſtone. The former enlarged on the bloodſhed, ravages, and rapacity, which had taken place in India. The eſtabliſhed ſyſtem of the ſervants of the company, he ſaid, was rapine, and robbery. The Mahratta war was occaſioned by their refuſal to be robbed; the famine at Madras was occaſioned by the miſconduct of the Engliſh government in India; and he ſet forth in ſtrong colours the manner in which the Indian princes and princeſſes had been plundered. He inſtanced, that Mr Haſtings had raiſed 800,000l. in Bengal by private loan; and uſed it is an argument that the company had ceaſed to exiſt, and that their commerce was nothing more than an inſtrument for procuring immenſe fortunes to individuals, totally deſtitute of conſcience or principle.

All this was excuſed by Governor Johnſtone. He regarded the ſum of 800,000l. as merely trifling, when the number of civil and military ſervants on the Bengal government was conſidered. The famine at Madras was owing to the modes of war which prevailed in the Eaſt; as the enemy there marked their courſe by deſolation. He concluded with cenſuring the manner in which Mr Haſtings had been ſpoken of; and inſiſted that his high reputation ought to have guarded him from ſuch inſults. Mr Burke replied by an intimation of his deſign to impeach Mr Haſtings on his return; whom he called the greateſt delinquent that had ever violated in India the rights of humanity and juſtice.

It was obſerved by Lord John Cavendiſh, that the territorial acquiſitions of the company were a fruitful ſource of grievance; and it would have been more for their advantage to have confined themſelves to their original character of merchants. However, as the territorial acquiſitions had been obtained, it was proper to take means for their preſervation; as otherwiſe they would not revert to the natives, but fall into the hands of our natural enemies the French.

In the houſe of peers the cauſe of the company was ably defended by Earl Fitzwilliam. He maintained, that their ſituation was deſperate, and bankruptcy inevitable, unleſs relief was inſtantly afforded. A report of their being in an inſolvent ſtate had gone abroad, and nothing was better calculated to preſerve and ſupport their credit than a large dividend ſanctioned by act of parliament. The expenditure on their ſettlements had far exceeded their revenue; of conſequence their ſervants had drawn bills, which they were unable to anſwer without a temporary ſupply. Thus the exiſtence of the company might be ſaid to depend on the bill; and he hoped no objections could be raiſed ſtrong enough to deſtroy it.

On the 18th of November 1783, Mr Fox propoſed his celebrated Eaſt India bill, which for ſome time attracted the attention of the nation at large in a very conſiderable degree. By this it was intended to take from the India proprietors and directors the entire adminiſtration of their territorial and commercial affairs. It took from them alſo their houſe in Leadenhall-ſtreet, together with all books, papers, and documents; veſting the entire management, the appointment of all officers and ſervants, the rights of peace and war, and the diſpoſal of the whole revenue, in the hands of certain commiſſioners. Theſe were, in the firſt inſtance, to be appointed by the whole legiſlature, but afterwards by the crown; and were to hold their offices by the ſame tenure as the judges in England, viz. during their good behaviour; and could be removed only by an addreſs from one of the houſes of parliament. They were required to come to a deciſion upon every queſtion within a limited time, or to aſſign a ſpecific reaſon for their delay. They were never to vote by ballot; and, almoſt in every caſe, were to enter the reaſon of their vote in their journals. They were alſo to ſubmit, once every ſix months, an exact ſtate of their accounts to the court of proprietors; and at the beginning of every ſeſſion, a ſtate of their accounts and eſtabliſhments to both houſes of parliament. Their number was limited to ſeven; but they were to be aſſiſted by a board of nine perſons, each of them poſſeſſed of 2000l. company's ſtock; who, as well as the commiſſioners, were to be appointed in the firſt inſtance by parliament, and ever afterwards by the court of proprietors. They were alſo to be removeable at the pleaſure of any five commiſſioners, and were diſqualified from ſitting in the houſe of commons. The whole ſyſtem of government thus propoſed, was to continue for the ſpace of three or five years.

This was accompanied with another bill, the profeſſed deſign of which was to preclude all arbitrary and deſpotic proceedings from the adminiſtration of the company's territorial poſſeſſions. By this the powers of the governor-general and ſupreme council were aſcertained more exactly than had hitherto been done: it deprived the governor-general of all power of acting independent of his council; preſcribed the delegation of any truſt; and declared every Britiſh power in the Eaſt incompetent to the acquiſition or exchange of any territory in behalf of the company, to the acceding to any treaty of partition, the hiring out of the company's troops, the appointing to office any perſon removed for miſdemeanour, or to the hiring out any property to a civil ſervant of the company. By this alſo monopolies were entirely aboliſhed; and illegal preſents recoverable by any perſon for his ſole benefit. The principal part of the bill, however, related to the zemindars, or native landholders, who were now to be ſecured by every poſſible means in the poſſeſſion of their reſpective inheritances, and defended in all caſes from oppreſſion. Laſtly, a mode was preſented for terminating the diſputes between the nabob of Arcot and the rajah of Tanjore; diſqualifying every perſon in the ſervice of the company from ſitting in the houſe of commons during his continuance in their ſervice, and for a certain ſpecified time after his demiſſion.

During the courſe of the debates on this bill, Mr Fox ſet forth the affairs of the company as in the moſt deſperate ſituation. They had aſked leave, he ſaid, the year before, to borrow 500,000l. upon bonds; had petitioned for 300,000l. in exchequer bills; and for the ſuſpenſion of a demand of 700,000l. due to government for cuſtoms. He took notice alſo, that, according to an act of parliament ſtill in force, the directors could not, by their own authority, accept bills to the amount of more than 300,000l.; under which circumſtances it would no doubt ſurpriſe the houſe to be informed, that bills were now coming over for acceptance to the amount of 2,000,000l. It was evidently, therefore, and indiſpenſably neceſſary, that government ſhould interfere in the affairs of the company to ſave them from certain bankruptcy. He ſtated their actual debt at no leſs than 11,200,000l. while their ſtock in hand did not exceed 3,200,000l. There was therefore a deficiency of 8,000,000l.; a moſt alarming ſum when compared with the company's capital. Unleſs ſpeedily aſſiſted, therefore, they muſt inevitably be ruined; and the ruin of a company of merchants ſo extenſive in their concerns, and of ſuch importance in the eyes of all Europe, could not but give a very ſevere blow to the national credit. On the other hand, the requiſite aſſiſtance was a matter of very extenſive conſideration. It would be abſolutely neceſſary to permit the acceptance of the bills to the above-mentioned amount; and to do this without regulating their affairs, and reforming the abuſes of their government, would only be to throw away the public money.

The conduct of the company's ſervants, and of the company itſelf, was now arraigned by Mr Fox in the moſt ſevere terms; and their miſconducts were pointed out under their following heads:

1. With regard to Mr Haſtings.—The chairman of the committee had moved in the houſe of commons, that it was the duty of the company to recal that gentleman; to which motion the houſe had agreed. In obedience to this reſolution, the directors had agreed that Mr Haſtings ſhould be recalled; but ſuppoſing this to be a matter rather beyond their juriſdiction, they had ſubmitted their determination to a court of proprietors, who reſcinded the reſolution of the directors; and after this the whole affair came to be laid before the houſe of commons. In the mean time every thing was anarchy and confuſion in the Eaſt, owing to this unſettled conduct with regard to the governor; as the whole continent had been made acquainted with the reſolution of the houſe for recalling him, while that of the proprietors for continuing him in his office was kept a ſecret. The proprietors had alſo been guilty of another contradiction in this reſpect, as they had voted their thanks to Mr Haſtings for his conduct in India. Hence Mr Fox was led to comment on the nature of the company's connexions with their ſervants abroad, as well as on the character of the company themſelves. Among the former, he ſaid, there were a few, who, being proprietors themſelves, endeavoured to promote the trade of the company, and increaſe its revenues. The views of the reſt were otherwiſe directed; and from the difference in ſpeculation between the two parties, the former were inclined to ſupport that governor who enabled them to make large dividends; and who, for that reaſon, after having peculated for his own advantage, was obliged to do the ſame for the benefit of the proprietors. The latter, therefore, could not better gratify their wiſhes, than by ſupporting a governor who had in his power ſo many opportunities of providing for his friends.

2. The next charge was againſt the ſervants of the company, whom he accuſed of a regular and ſyſtematic diſobedience to the orders of the proprietors.—The ſupreme council of Bengal, he ſaid, had reſolved, in oppoſition to Mr Haſtings, to ſend two gentlemen, Mr Fowke and Mr Briſtow, the one to reſide with the nabob of Oude, the other at Benares. Mr Haſtings, however, refuſed to ſend them; the directors tranſmitted the moſt poſitive orders to carry the vote of the ſupreme council into execution; but ſtill Mr Haſtings diſobeyed; alleging in his defence, that he could not employ perſons in whom he had no confidence. Afterwards, however, Mr Haſtings ſeemed to contradict himſelf in a very curious manner. He granted Mr Fowke a contract, with a commiſſion of 15 per cent.; which, he obſerved, was a great ſum, and might operate as a temptation to prolong the war.

“But (added he) the entire confidence I have in the integrity and honour of Mr Fowke, amounts to a full and perfect ſecurity on that head.”

To this Mr Fox added ſome other inſtances of a ſimilar kind; but though he ſupported theſe and the projected bill with all the argument and eloquence for which he is ſo remarkable, he found it impoſſible to make his ſcheme agreeable to the majority of the houſe. The ſtrongeſt opponent was Mr William Pitt, who inſiſted chiefly on the two following topics. 1. Its infringement, or rather annihilation of the company's charter; and, 2. The new and unconſtitutional influence it tended to create.—He owned indeed, that India ſtood in need of a reform, but not ſuch a one as broke through every principle of juſtice and reaſon. The charter of the company was a fair purchaſe from the public, and an equal compact for reciprocal advantages between the proprietors and the nation at large; but if it was infringed in the manner propoſed by the bill, what ſecurity could other trading companies have that they ſhould not be treated in the ſame manner? nay, what ſecurity could there be for Magna Charta itſelf? The bill, he ſaid, amounted to a confiſcation of property. It had been ſuggeſted, indeed, that it was not a bill of disfranchiſement, becauſe it did not take from the proprietors their right to an excluſive trade; but this was not the only franchiſe of the proprietors. A freehold might have a franchiſe annexed to it, the latter of which might be taken away, and yet the property of the former remain; in which caſe it could not be denied that the freeholders would have great cauſe to complain. The caſe was exactly parallel with the India ſtock. Perſons poſſeſſed of this to a certain amount, were entitled to a vote upon every important queſtion of the company's affairs; and on this account the purchaſe-money was more conſiderable. But, by the bill in queſtion, this privilege was to be taken away; which plainly amounted to a disfranchiſement.

The great objection to this bill, however, ſeemed to be a ſuſpicion that it was a ſcheme of Mr Fox to gratify his own perſonal ambition as a miniſter, he being at that time ſecretary of ſtate. On this account he was deſerted even by the patriotic members, who, upon former occaſions, had ſo ſtrenuouſly ſupported his cauſe.—Mr Dundas accuſed him of attempting to create a fourth eſtate in the kingdom, the power and influence of which might overturn the crown and ſubvert the conſtitution of Britain. A petition was preſented from the proprietors, and another from the directors of the company, repreſenting the bill as ſubverſive of their charter, and confiſcating their property, without either charge of delinquency, trial, or conviction. They prayed, therefore, that the acts of delinquency preſumed againſt them might be ſtated in writing, and a reaſonable time allowed them to deliver in their anſwer; and that they might be heard by counſel againſt the bill. About the ſame time the directors gave in a ſtate of the company's affairs, differing in the moſt extraordinary manner from that given by Mr Fox. In this they repreſented the creditor ſide of the account as amounting to 14,311,173l. and they brought themſelves in debtors to the amount of 10,342,692l.; ſo that of conſequence there was a balance in their favour of 3,968,481l. This was vehemently conteſted by the ſecretary, who ſaid he could bring objections to the ſtatement of the directors to the amount of more than 12,000,000l. ſterling. He then entered into a particular diſcuſſion of the articles ſtated in the directors account, and made good his aſſertion. Objections to this method of calculation, however, were made on the part of the company; ſo that nothing could certainly appear to the public but that the company were at that time much diſtreſſed, and would fail entirely unleſs powerfully ſupported by government.

Mr Fox now proceeded to a particular refutation of the arguments brought againſt the bill; in which indeed he diſplayed an aſtoniſhing force of argument and acuteneſs of reaſoning. The objection drawn from the validity of the company's charter, he ſet aſide, by ſhowing that the company had abuſed their power, and that it was therefore neceſſary to take it from them. This he ſaid always had been the caſe, and muſt be the caſe in a free nation; and he brought the example of James II. who, on account of the abuſe of his power, had been deprived of it by the nation at large. The caſe was the ſame with the company. They had made a bad uſe of their power, and therefore the nation at large ought to deprive them of it. It had been objected by the country gentlemen, that the bill augmented the influence of the crown too much; and by Mr Dundas, that it reduced it to nothing. Both theſe objections, he ſaid, were overturned by the circumſtance of making the commiſſioners hold their office only during good behaviour. Thus, when conſcious that they were liable to puniſhment if guilty, but ſecure in caſe they faithfully diſcharged their truſt, they would be liable to no ſeduction, but would execute their functions with glory to themſelves, and for the common good of their country and of mankind. He then drew a compariſon betwixt his own bill and that of Mr Dundas's already mentioned. The bill of the latter, he ſaid, had created a deſpotic authority in one man over ſome millions of his fellow-creatures; not indeed in England, where the remedy againſt oppreſſion was always at hand; but in the Eaſt Indies, where violence, fraud, and miſchief, everywhere prevailed. Thus the bill propoſed by Mr Dundas afforded the moſt extenſive latitude for malverſation, while his own guarded againſt it with every poſſible care; as was inſtanced in its confiding in no integrity; truſting in no character; and annexing reſponſibility not only to every action, but even to the *inaction* of the powers it created.

After having expatiated for a conſiderable time, the ſecretary was ſeconded by Mr Burke, whoſe force of oratory was chiefly directed, as indeed it uſually was when ſpeaking of India affairs, on the monſtrous abuſe of the company's power in that quarter. He affirmed that there was not in India a ſingle prince, ſtate, or potentate, with whom the company had *come into contact*, whom they had not ſold; that there was not a ſingle treaty they had ever made which they had not broken; and that there was not a ſingle prince or ſtate that had ever put any confidence in the company who had not been ruined. With regard to the firſt article, Mr Burke inſtanced the ſale of the Great Mogul himſelf; of the Rohillas; the nabob of Bengal; the polygars of the Mahratta empire; Ragobah the pretender to that empire ; and the ſubah of Decan.—The ſecond article was proved by a review of the tranſactions from the begining to the end of the Mahratta war. With regard to the third, viz. the ruin of ſuch princes as put any confidence in the company or their ſervants, he deſired them to look into the hiſtory and ſituation of the nabob of Oude. In the year 1779, this country had been viſited by a famine; a calamity which had been known to relax the ſeverity even of the moſt rigorous government : yet in this ſituation the preſident of Bengal had put an abſolute negative upon the repreſentation of the prince ; adding, that perhaps expedients might be found for affording him a gradual relief; but their effects muſt be diſtant. This diſtant relief, however, never arrived, and the country was ruined.

Our limits will not allow a particular detail of the charges againſt the company on the one hand, or the defences on the other. In general, it muſt appear, that ſuch ſevere and heavy charges could not be advanced without ſome foundation, though perhaps they may have been conſiderably exaggerated by the orators who brought them. The picture drawn by Mr Burke on this occaſion indeed was ſhocking. " The Arabs, Tartars, and Perſians, had conquered Indoſtan with vaſt effuſion of blood; while the conqueſts of the Engliſh had been acquired by artifice and fraud, rather than by open force. The Aſiatic conquerors, however, had ſoon abated of their ferocity; and the ſhort life of man had been ſufficient to repair the waſte they had occaſioned. But with the Engliſh the caſe had been entirely different. Their conqueſts were ſtill in the ſame ſtate they had been 20 years ago. They had no more ſociety with the people than if they ſtill reſided in England; but, with the view of making fortunes, rolled in one after another, wave after wave; ſo that there was nothing before the eyes of the natives but an endleſs proſpect of new flights of birds of prey and paſſage, with appetites continually renewing for a food that was continually waſting. Every rupee gained by an Engliſhman in India was for ever loſt to that country. With us there were no retributory ſuperſtitions, by which a foundation of charity compenſated, for ages, to the poor, for the injuſtice and rapine of a day. With us no pride erected ſtately monuments, which repaired the miſchiefs pride had occaſioned, and adorned a country out of its own ſpoils. England had erected no churches, no hoſpitals, no palaces, no ſchools (the trifling foundation at Calcutta excepted); England had built no bridges, made no high-roads, cut no navigations, dug no reſervoirs. Every other conqueror of every other deſcription had left ſome monument either of ſtate or beneficence behind him; but were we to be driven out of India this day, nothing would remain to tell that it had been poſſeſſed, during the inglorious period of our dominion, by any thing better than the oran-outang or the tiger !"

All this eloquence, however, was at preſent entirely ineffectual, and the bill was finally rejected : much confuſion and altercation enſued, which terminated in a change of miniſtry and diſſolution of parliament. On the 26th of May 1784 a petition from the company was preſented to the houſe of commons, praying for ſuch relief as the nature of their affairs might ſeem to demand. This was followed on the 24th of June by a bill for allowing the company to divide four per cent. for the half year, concluding with midſummer 1784. This having paſſed, after ſome debate, a new bill was propoſed by Mr Pitt for relieving the company in the mean time, and regulating their affairs in time to come. A bill to this purpoſe had been brought in during the laſt ſeſſion of the former parliament by the ſame gentleman, which he wiſhed to bring to a compariſon with that of Mr Fox, of which an account has already been given. In this bill he began with laying it down as a principle, that " the civil and military government of India, or, in other words, the imperial dominion of our territories in the Eaſt, ought to be placed under other controul than that of the merchants in Leadenhall ſtreet; and this controul could be no other than the executive branch of the conſtitution. The commerce of the company, however, ought to be left as free from reſtrictions as poſſible; and, laſtly, capricious effects from the government of India upon the conſtitution of Britain were to be carefully avoided. A controul in the executive branch of the legiſlature over the government of India had indeed been eſtabliſhed by the regulation bill of 1773; but the former interference of miniſters had not been beneficial, becauſe it had not been active and vigilant. He now propoſed, therefore, that a board ſhould be inſtituted expreſsly for the purpoſe. This board was to be appointed by the king, and to conſiſt of the ſecretary of ſtate for the home department, the chancellor of the exchequer, and a certain number of the privy council. To this board the diſpatches of the company were to be ſubmitted, and were not to be ſent to India until they were counterſigned by them. To prevent queſtions concerning the commercial and political concerns of the company, it was propoſed, that the diſpatches upon the former ſubject ſhould be ſubmitted to the board; and that, in caſe of any difference, an appeal ſhould be made to the king in council. Though he (Mr Pitt) had not thought proper to accept of the propoſal of the company to yield the appointment of foreign councils to the crown, he was nevertheleſs clearly of opinion, that the commander in chief ought to be appointed by the king. He propoſed alſo that this commander ſhould have a vote in council next to the preſident; that the king ſhould be empowered to beſtow the reverſion of his office ; that the king might recal the governor-general, the preſidents, and any members of their councils. He yielded the appointment of all officers, with the ſingle exceptions he had ſtated, to the court of directors, ſubject, however, to the approbation of the king ; and that, in caſe of a negative, the directors ſhould proceed to a ſecond choice, and ſo on. He deprived the court of proprietors of their privilege of reſcinding or altering the proceedings of the court of directors : and with reſpect to the foreign government, he was of opinion, that their authority ſhould compriſe in it a conſiderable diſcretion, accompanied with the reſtraint of reſponſibility. He propoſed, that there ſhould be a reviſion of the eſtabliſhments in India with a view to retrenchments; that appointments ſhould take place by gradation; and that a new and ſummary tribunal ſhould be erected for the trial of offences committed in that country. With regard to the zemindaries, though he could not help paying a compliment to Mr Fox, on his intention of reſtoring them to their proper owners, he yet thought that a general and indiſcriminate reſtitution was as bad as an indiſcriminate confiſcation. He therefore propoſed, that an inquiry ſhould be inſtituted for the purpoſe of reſtoring ſuch as had been irregularly and unjuſtly deprived, and that they ſhould in time to come be ſecured againſt violence.

In the bill of 1784 few alterations were made; and theſe uniformly tended to enlarge the powers of the board of controul. They were permitted, in caſes of emergency, to concert original meaſures, as well as to reviſe, correct, and alter thoſe of the directors. In matters relative to peace or war, where ſecrecy was a principal object, they were allowed to ſend their orders directly to India, without any communication with the directors; to the commander in chief without any communication with the preſidencies; and the number of perſons conſtituting the different councils of Bengal, Fort St George, and Bombay, was determined.—The governor-general and council of Bengal were to have an abſolute power to iſſue orders to the inferior preſidencies, in ſuch caſes as did not interfere with the directions already received from Britain; adding a power of ſuſpenſion in caſe of diſobedience. The ſupreme council were forbidden, unleſs any of the Indian princes ſhould have firſt commenced or meditated hoſtilities, to enter upon war, or form an offenſive treaty, without orders from home. The inferior councils were forbidden in all caſes to form alliances; and in caſes of urgency, were commanded to inſert a proviſional clauſe, rendering the permanency of the alliance dependent on the confirmation of the governor-general.

Various ſalutary regulations were propoſed concerning the behaviour of the company's ſervants, againſt whom ſo great complaints had been made. Inquiry was ordered to be made by the different preſidencies into the expulſions that might have been made of any of the hereditary farmers, and of the oppreſſive rents and contributions that might have been extorted from them; and meaſures were directed to be taken for their relief and future tranquillity. A ſimilar examination was ordered into the different eſtabliſhments in the Indian ſettlements; a report of which was to be laid annually before parliament. The company were prohibited from ſending out a greater number of cadets or writers than what were abſolutely neceſſary; and it was likewiſe provided, that the age of ſuch as were ſent out, ſhould not be leſs than 15, nor more than 22 years. It was likewiſe provided, that promotions ſhould be made in the order of ſeniority, unleſs in extraordinary caſes; for which the preſidencies ſhould make themſelves ſpecifically reſponſible. Crimes committed by Engliſh ſubjects in any part of India, were made amendable to every Britiſh court of juſtice, in the ſame manner as if they had been committed in Britain. Preſents, unleſs ſuch as were abſolutely ceremonial, or given to a counſellor at law, a phyſician, a ſurgeon, or a chaplain, were abſolutely prohibited, under the penalty of confiſcation of the preſent, and an additional fine at the diſcretion of the court. Diſobedience of orders, unleſs abſolutely neceſſary, and pecuniary tranſactions prejudicial to the intereſts of the company, were declared to be high crimes and miſdemeanors. The company were forbidden to interfere in favour of any perſon legally convicted of any of the above crimes, or to employ him in their ſervice for ever. The governors of the different preſidencies were alſo permitted to impriſon any perſon ſuſpected of illicit correſpondence, and were ordered to ſend them to England with all convenient ſpeed. Every perſon ſerving, or who ſhould hereafter ſerve in India, was alſo required, on his return to England, to give an exact account, upon oath, to the court of exchequer, of his property, within two months after his arrival; one copy of which was to be kept in the court of exchequer, and the other at the India-houſe. The board of controul, the court of directors, or any three of the proprietors whoſe ſtock ſhould amount together to 1000l. were allowed to move the court of exchequer to examine the validity of the account. In caſe of an apparently well-founded accuſation, the court of exchequer were allowed to examine the party upon oath, and even to impriſon him until the interrogatories propoſed to him ſhould be anſwered. The whole property of a perſon who ſhould neglect to give in ſuch an account within the time limited, or who ſhould have been guilty of a miſrepreſentation in that account to the amount of 2000l. ſterling, was ordered to be confiſcated; ten per cent. to be paid to the accuſer, and the remainder to be equally divided between the public and the company. Every perſon who had once been employed in India, but had afterwards reſided in Europe for five years, unleſs ſuch reſidence had been expreſsly on account of his health, was declared incapable of ever being ſent out to India again.

As a farther curb on the company's ſervants, the attorney-general or court of directors was authorized to file an information in the court of king's bench againſt any perſon for crimes committed in India. That court was empowered alſo to impriſon or admit the accuſed to bail immediately. It was then ordered, that within 30 days a certain number of peers ſhould be choſen by the houſe of lords, and of the members of the houſe of commons by that houſe, to conſtitute a court for the trial of the accuſed. The court was finally to conſiſt of three judges appointed by the crown, four peers, and ſix members of the houſe of commons; and the accuſed had a right to a peremptory challenge. From this court there was no appeal; and it was empowered to adjudge the party incapable of ever ſerving the company; to puniſh by fine or impriſonment; and in order to proportion the fine to the property of the convict, the court of exchequer might at the requiſition of the attorney-general, or of the company, examine him upon oath concerning the ſum he was worth. A refuſal to anſwer was to be puniſhed with confiſcation of property, and impriſonment during pleaſure.

With regard to the treatment of delinquents in India, Mr Pitt obſerved, that at that time we had it not in our power to puniſh them. Either a new proceſs muſt therefore be inſtituted, or offences, equally ſhocking to humanity, and contrary to every principle of religion and juſtice, muſt be permitted to continue unchecked. Every perſon therefore who went hereafter, would know the predicament in which he ſtood; and would underſtand, that by ſo doing he agreed to give up ſome of the moſt valuable privileges of an Engliſhman:

man: yet in this he would do no more than a very numerous and honourable body of men, the military, did daily, without the leaſt heſitation, or the ſmalleſt impeachment of their character.

This bill, ſo tremendous in its appearance to the company's ſervants, was vehemently oppoſed by the minority. Mr Francis obſerved, that it went upon two principles, viz. the abuſe of power abroad, and the want of it at home. To remedy theſe, Mr Pitt had propoſed to augment the power abroad, and to diminiſh that at home. He condemned the unlimited power of the commiſſioners, and even pretended to ſuppoſe that there muſt have been ſome miſtake in the ſtructure of the clauſe; it being impoſſible to think that it was intended to ſet aſide the directors at home and the government abroad, in order to throw the whole power into the hands of a military commander. Though he approved of the clauſe by which ſchemes of conqueſt and extenſion of territory were condemned, he remarked, that it was eſſentially defective in other reſpects; as alluding to facts and offences which were not deſcribed, and to criminals whom, ſo far from puniſhing, it did not venture to deſcribe. With reſpect to the affair of preſents, he confeſſed that his opinion was rather ſingular. He was for an unlimited prohibition to men in high ſtations; but in the ordinary tranſactions of buſineſs, he was of opinion that they were uſeful, without giving room for any juſt apprehenſions. The government of India, as it was now conſtituted, was a government of favour, and not of juſtice; and nothing would be done for the natives unleſs the perſons who forward their affairs were gratified. In the mean time, however, the exception in favour of preſents of ceremony was founded upon ideas which he knew to be fallacious, and was even calculated to render the prohibition itſelf uſeleſs and ineffectual. For the purpoſe of receiving preſents of ceremony, all occaſions would be ſufficiently ſolemn. He warmly cenſured alſo the power of impriſonment given to the reſpective preſidencies, and he condemned the inſtitution of the new court of judicature as unneceſſary, arbitrary, and dangerous.

By Mr Fox the bill was ſo highly diſapproved of, that he objected to the houſe going into a committee upon it. He endeavoured to ſhow, that inſtead of diminiſhing, it was calculated to increaſe the calamities of the Eaſt; and inſtead of reforming, to perpetuate the abuſes ſo much complained of. The board of controul, he ſaid, provided for a weak government at home by a diviſion of power; and if there were a receipt or a noſtrum for making a weak government, it was by giving the power of contriving meaſures to one, and the nomination of the perſons who were to execute them to another. The negative given to the commiſſioners operated as a complete annihilation of the company, and the chartered rights ſo much vaunted of. The bill was a ſcheme of dark and deluſive art, and took away the rights of the company by ſlow and gradual ſap. The firſt ſtep was originally to contrive meaſures without the knowledge of the company; and the next, to convey orders ſecretly to India, at the very time perhaps that the commiſſioners were openly giving countenance to orders of a quite different tendency ſent from the directors. With regard to the new tribunal, he conſidered it as in truth a ſcreen for delinquents; ſince no man was to be tried but on the accuſation of the company or of the attorney-general; in which caſe he had only to conciliate government in order to remain in perfect ſecurity.

The oppoſition of Mr Fox's party againſt this bill proved as fruitleſs as their efforts had been in favour of the other. The houſe divided on the ſpeaker's leaving the chair; when the motion was carried by a majority of 215. Still, however, all parts of the bill were warmly debated. In the courſe of converſation upon this ſubject, Mr Dempſter expreſſed a wiſh that the king could be requeſted to ſend over one of his ſons to become ſovereign of that country. We might then enter into a federal union, and enjoy all the benefits that could be derived from the inhabitants of the Eaſt by Europeans, viz. thoſe of commerce. The clauſes relative to the native princes and hereditary farmers were all withdrawn at the motion of Mr Dundas; and under the head of preſents, the exception in favour of thoſe of ceremony was withdrawn. That clauſe, which inſiſted on all perſons returning from India to give an account of the value of their eſtates upon oath, was ſeverely cenſured by Mr Dempſter and Mr Eden; and after ſome debate was entirely withdrawn, as was alſo the idea of making the perſon take the oath when required by the board of controul. Mr Pitt then propoſed, that perſons who had paſſed five years in India, and accumulated no more than 5000l. for that time, or double that ſum for the next five years, ſhould be exempted from all proſecution on the ſcore of their fortunes. But on a ſuggeſtion by Mr Atkinſon, that, in caſe of ſickneſs, it might not be practicable for a perſon arriving from India to give in an account upon oath in the ſpace of two months; on which ſuggeſtion a power was granted to the court of exchequer for extending the term from time to time as they ſhould think proper. It had been the original idea of the chancellor, that this juriſdiction ſhould take place in twelve months; and it had been objected, that thus perſons would be deprived of the trial by jury, without time being granted them to chooſe whether they would ſubmit to the condition. Mr Pitt now moved, that no account upon oath ſhould be required of any perſon who ſhould arrive from India before the firſt of January 1787. This amendment was likewiſe cenſured by oppoſition, as holding out an indemnity to peculators, and a warning for them to return within the aſſigned period. It was remarked by Mr Sheridan, that by the bill before the houſe, a perſon who took the oath would be liable all his lifetime to a proſecution for perjury. He could therefore make no ſettlement of his fortune; he could not ſell or mortgage his eſtate, as nobody would have any thing to do with a property which was ſtill liable to conteſt and forfeiture. This repreſentation produced another amendment, limiting the commencement of a proſecution to the period of three years. The clauſe prohibiting the return of any perſon to India under certain conditions, was alſo mitigated by two amendments from the chancellor; one of them exempting the officers of the king from its operation; and the other permitting the reſtoration of any perſon with the conſent of the directors, and three-fourths of the court of proprietors.

With theſe amendments the bill finally paſſed the houſe of commons on the 28th of July. On being carried up to the houſe of lords, it met with a very vigorous oppoſition; the principal ſpeakers againſt it being Lord Stormont and the earl of Carliſle. The former animadverted upon the principle of ſeniority eſtabliſhed by it; which he ſaid was particularly ill-ſuited to the critical poſture of affairs and our preſent ſituation in India; and he aſſerted, that had ſuch a clauſe been in effect at the time that Lord Clive firſt entered into the company's ſervice, there would not have been an inch of the territorial poſſeſſions at preſent belonging to this country. It would damp the ardour of emulation, check the riſing ſpirit of the youth now in Aſia, and that at a time when the moſt extraordinary talents were neceſſary to raiſe us from our inauſpicious and ruined condition. He objected alſo to the power of recal in the board of controul; which, he ſaid, was by no means a ſufficient check upon the company's ſervants in India. The diſtance of time and place, he ſaid, were ſo great, that a recal from India could not have the leaſt effect. But theſe remonſtrances had very little weight with the houſe: the bill being finally paſſed on the 9th of Auguſt.

Some years after this, however, a declaratory law was found neceſſary, in conſequence of a controverſy which had ariſen between the board of controul and the company. It had been reſolved, in the month of October 1787, when his majeſty had reaſon to be alarmed, and to look with more than common anxiety to the ſafety and preſervation of every part of the Britiſh dominions, to ſend out four additional regiments for the better protection of our Indian poſſeſſions; nor was the deſign taken up as a temporary, but with a view to a permanent, eſtabliſhment of his majeſty's troops in India. At that time, no unwillingneſs to receive the reigments on board the company's ſhips, and provide for their ſupport in India, had been intimated by the court of directors; but, on the contrary, the meaſure had been conſidered as a wiſe one, and the ſuggeſtion of it had given univerſal ſatisfaction. Since, however, the threatening ſtorm had been diſperſed, far different ſentiments prevailed. Some of the directors, at leaſt, were of opinion, that unleſs they made a requiſition to government for further military aſſiſtance, they had it in their option to bear, or to refuſe to bear, the expence of any additional regiments of his majeſty's army which might be ſent to India; and this opinion ſeemed to be, in a great meaſure, grounded on the act of 1781, by which the Eaſt India Company were bound to pay for ſuch of his majeſty's troops as had, by their requiſition, been ſent to India. This idea had been much agitated without doors, and the directors had thought proper to conſult different counſel of eminence on the ſubject.

In this buſineſs two queſtions naturally aroſe:—Firſt, Whether the king had a right to ſend his troops to any part of his dominions? and, ſecondly, If he ſent them to India, who ought to defray the expence? That his majeſty had an undoubted right, by his royal prerogative, to direct the diſtribution of his army, no one could, with any colour of reaſon, diſpute. The only point, therefore, which offered itſelf for diſcuſſion was, whether, if his majeſty, by virtue of his prerogative, thought proper to ſend four additional regiments to India, the expence of ſending them, and their ſupport, ought to be provided for out of the revenues of India, which they protected? It was certainly the opinion of miniſters, that by the act of 1784, the authority and power of the court of directors, touching the military and political concerns of India, and alſo the collection, management, and application of the revenues of the territorial poſſeſſions, was transferred to the board of controul, which might direct the appropriation of theſe revenues in the manner that to them ſhould appear to be moſt for the public advantage; but as doubts had been entertained by others, and the opinions of counſel, confirming thoſe doubts, had been taken, all of which had gone abroad into the world, it was conſidered as a neceſſary meaſure to call upon the different branches of the legiſlature to remove thoſe doubts in the moſt effectual way by a bill. It was certainly very evident, that, on the preſent occaſion, the four regiments might, on board the company's ſhips, be ſent out to India at a very inconſiderable expence; whereas, if tranſports had been ſpecially provided for that purpoſe, the expence muſt have been enormous. To oblige the company, therefore, to pay the expence out of their Indian revenues, as had already been intimated to them by the commiſſioners of controul, the chancellor of the exchequer moved, on the 5th of February 1788, "That leave be given to bring in a bill for removing any doubts reſpecting the power of the commiſſioners for the affairs of India."

In explanation of this bill, and in anſwer to the remarks of oppoſiton, Mr Pitt deſired to remind the houſe that he had provoked the diſcuſſion of the bill, and had earneſtly ſolicited them to bring it to the teſt of the moſt ſevere and ſcrupulous inveſtigation. He found that it would be diſputed, whether by the act of 1784 the board of controul had any right of ſuperintendence over the revenue. Would it be contended that parliament meant to leave the finances in the hands of the company, who had been declared unfit to be truſted with them? Was it likely, that, when they provided for the better management of the political and military concerns, they had paid no attention to the circumſtance upon which theſe concerns inſeparably depended? The board of controul had already proceeded to reduce the enormous eſtabliſhments in India; their right of interference in that reſpect had never been queſtioned; and what indeed would be the conſequence of denying this right? The court of directors, if they had it in their power, as the expiration of their charter drew near, and it was doubtful whether their monopoly would be renewed, would certainly make it their firſt object to ſwell the amount of their imports, and would neglect the care of the territorial and political ſtate of India. The duty of adminiſtration was to look, firſt, to the proſperity and happineſs of the natives; ſecondly, to the ſecurity of the territorial poſſeſſions; thirdly, to the diſcharge of the debts due to the perſons who had advanced their money, and enabled the company to ſtruggle with their late difficulties; and, in the laſt place, to the commercial benefit of the proprietors. Was it probable that the court of directors would act upon that ſcale? Could it have been intended to confide in their diſcretion? It had been ſaid, that the powers attributed to the board of controul were the ſame in ſubſtance as had before been given to the ſecretaries of ſtate and the lords of the treaſury. But the fact was otherwiſe. The court of directors had been obliged to communicate their diſpatches previous to their going to India; but there was no obligation upon the ſecretary of ſtate to give any directions concerning them. The reſponſibility had ordinarily reſted, under the former government, with the court of directors; under the preſent it was wholly veſted with the board of controul.

An objection had been ſtated, that the declaratory bill conveyed to the king the power of maintaining an army without the conſent of parliament. No propoſition (Mr Pitt obſerved) could be more adverſe to his intentions than that which was thus imputed to him. But in reality the troops in queſtion had already been recogniſed by parliament when they voted the eſtimate for raiſing them; and the number of king's regiments ſerving in India would always be to be aſcertained by the company belonging to each, which remained in England for the purpoſe of recruiting, and the expence of which would be to be provided for by parliament.

Mr Pitt acknowledged, that it had been the object of the act of 1784 to aſſume the power of ſuperintendence and controul, without aſſuming the power of patronage. In the preſent bill he declared, that every thing had been done which his underſtanding had ſuggeſted for the diminution of patronage. The regiments in queſtion belonged to the crown; and of courſe it could not be ſuppoſed that the ſovereign could entirely depart from his prerogative of naming his own officers. But the king had acted with the moſt gracious attention to the company, and to the merits of the officers who had grown gray in their ſervice; having relinquiſhed nearly half the patronage of the regiments, and leaving the diſpoſal of theſe commiſſions to the court of directors. The company indeed alledged that they had 600 officers unemployed; but the king could not forget that he had 2800 officers upon half-pay, not perhaps more meritorious, but certainly not leſs ſo, than thoſe in the company's ſervice, and many of whom had actually ſerved with diſtinction in India. Such had been the forbearance he had thought it proper to exerciſe upon the ſubject of patronage. But if, by the objection that had been ſtated, it was intended to refer to the great political patronage, this he did not deny that he had at all times intended to aſſume. Men who were reſponſible for the government of a country, ought undoubtedly to have the appointment of thoſe whom they were to entruſt with the execution of their orders. But it would be admitted that the patronage left to the company was very conſiderable, when the great extent of their military eſtabliſhment was properly recollected. Mr Pitt added, that the objections that were ſtated on this head would poſſibly throw difficulties in the way of the conſolidation of the two armies in India; an object on many accounts deſirable, and which in ſome way or other muſt be attempted. If it ſhould be thought adviſable to make the whole army royal, then undoubtedly the patronage of the crown would be greatly increaſed. He believed, however, that the meaſure was neceſſary; and there was ſcarcely any thing to which he would not aſſent, to remove the apprehenſions of the nation reſpecting the undue uſe of this patronage. For the bill now before the houſe, Mr Pitt profeſſed himſelf ready to propoſe clauſes that ſhould annihilate every ſuſpicion of danger.

The ſpeech of Mr Pitt produced a favourable effect upon the country gentlemen; and the clauſes which he had alluded to being moved, were received without any debate. Theſe provided, That no king's troops, beyond the number which was now propoſed, ſhould be ſent to India under the authority of any exiſting law: That no increaſe of ſalary ſhould be given to any of the ſervants of the company, without the diſpatches for that purpoſe being laid before both houſes of parliament thirty days previous to their being ſent; and that no gratuity ſhould be given, the propoſal for which did not originate with the court of directors. A fourth clauſe was added to theſe by the miniſter, which had not preciſely the ſame object: it directed, that an account of the revenues and diſburſements of the company ſhould be laid before parliament at a certain aſſigned period in the courſe of every year.

The bill was carried up to the houſe of lords on the 14th of March, read a firſt time on the following day, which was Saturday, and propoſed for a ſecond reading on the enſuing Monday. This precipitation was made the ſubject of a petition, offered by certain proprietors, and preſented to the houſe by the duke of Norfolk, in which they requeſted a delay of three days, till a general meeting could be held of the proprietors of the Eaſt India company. To this ſuggeſtion it was objected by Lord Thurlow and Lord Hawkeſbury, that the ſhips of the Eaſt India company were now detained in port at the enormous expence of three or four hundred pounds per diem. By Lord Stormont and Lord Loughborough it was replied, that no expence, however great, ought to weigh in the conſideration of the preſent queſtion. The bill decided upon a matter of private right, and parliament could not juſtly refuſe to hear the petitioners. The houſe divided upon the queſtion, contents 32, not-contents 75. A motion of Lord Porcheſter was rejected by a ſimilar majority, for referring a queſtion to the twelve judges reſpecting the true meaning and intent of the act of 1784.

The duke of Richmond ſaid, that he was peculiarly circumſtanced on the preſent occaſion, ſince he had never been pleaſed with any of the bills for the government of India that had yet been brought into parliament. He had ever been of opinion, that the concerns of the Eaſt were truſted in the beſt hands when they were veſted in the company itſelf. He had oppoſed the bill of 1783, becauſe it flagrantly violated the charter of the company, and placed an immenſe power in the hands of a commiſſion, that was not reſponſible, ſo far as he could find, either to the king or the parliament. He had oppoſed the act of 1784, becauſe it gave to the crown an enormous addition of power. But he could not admit that the act was in any degree ſo violent and deſpotical as the bill which preceded it. The declaratory meaſure now under conſideration muſt neceſſarily have his complete approbation. It conſiſted of two diſtinct parts; its expoſition of the act of 1784, and certain enacting clauſes containing checks and reſtraints upon the extenſive patronage that the government of the Eaſt naturally gave. To the former part he muſt inevitably agree. That the act of 1784 gave to the board of controul complete authority, had always been his opinion. For that reaſon he had oppoſed it; but entertaining that opinion, he muſt juſtify the preſent bill, which in his mind was a true declaration of the fact. He could not but equally approve of the reſtraints that were propoſed upon the exerciſe of patronage. Patronage was inſeparable from power. But when he ſaw the induſtry with which it was limited, and miniſters were tied down from the abuſe of it; when he ſaw that it was not to be uſed otherwiſe than for the good of the ſervice, he could not view the preſent meaſure with the ſame jealouſy with which he was accuſtomed to regard propoſitions for extending the power of the crown.

The bill, however, underwent a ſevere diſcuſſion in this as it had done in the other houſe; but at length paſſed.

In May following a petition was preſented to the houſe of commons by the company, ſtating certain pecuniary embarraſſments which they apprehended to take place on the firſt of March 1790, owing to the arrears of the war, to the government claim of 500,000l. to the debt incurred in China, and to the advances neceſſary to be made for the purpoſes of the China trade. In compliance with their petition Mr Pitt moved on the following day that they ſhould be empowered to borrow a ſum not exceeding 1,200,000l. He at the ſame time obſerved, that in all probability the company in 1791 would have upwards of 3,000,000l ſterling more than ſufficient to diſcharge their debts. The meaſure was carried through both houſes without oppoſition.

3. *Hudſon's Bay Company.* The vaſt countries which ſurround Hudſon's Bay abound with animals whoſe furs and ſkins are excellent, being far ſuperior in quality to thoſe found in leſs northerly regions. In 1670, a charter was granted to a company, which does not conſiſt of above nine or ten perſons, for the excluſive trade to this bay; and they have acted under it ever ſince with great benefit to themſelves. The company employ four ſhips and 130 ſeamen. They have ſeveral forts, viz. Prince of Wales's fort, Churchill river, Nelſon, New Severn, and Albany, which ſtand on the weſt ſide of the bay, and are garriſoned by 186 men. The French, in May 1782, took and deſtroyed theſe forts, and the ſettlements, &c. valued at 500,000l. They export commodities to the value of 16,000l. and bring home returns to the value of 29,340l. which yield to the revenue 3734l. This includes the fiſhery in Hudſon's Bay. This commerce, ſmall as it is, affords immenſe profits to the company, and even ſome advantages to Great Britain in general; for the commodities we exchange with the Indians for their ſkins and furs, are all manufactured in Britain; and as the Indians are not very nice in their choice, ſuch things are ſent of which we have the greateſt plenty, and which, in the mercantile phraſe, are drugs with us. Though the workmanſhip too happens to be in many reſpects ſo deficient that no civilized people would take it off our hands, it may be admired among the Indians. On the other hand, the ſkins and furs we bring from Hudſon's Bay, enter largely into our manufactures, and afford us materials for trading with many nations of Europe to great advantage. Theſe circumſtances tend to prove inconteſtably the immenſe benefit that would redound to Great Britain, by throwing open the trade to Hudſon's Bay, ſince even in its preſent reſtrained ſtate it is ſo advantageous. This company, it is probable, do not find their trade ſo advantageous now as it was before we got poſſeſſion of Canada. The only attempt made to trade with Labrador has been directed towards the fiſhery, the annual produce of which exceeds 49,000l.

THE above are the principal trading companies preſently ſubſiſting in Great Britain; but to the number might have been added one of vaſt importance, the *Scotch Darien Company*, had it not been for the crooked and puſillanimous policy of the Engliſh miniſtry at the time. For an account of which, ſee the article DARIEN.

Greenland COMPANY. See GREENLAND.
Banking COMPANIES. See BANK.

Of eſtabliſhments ſimilar to the above in other countries, the following belonging to the Dutch and French, may be mentioned as the moſt important.

I. DUTCH Companies. 1. Their Eaſt India company had its riſe in the midſt of the ſtruggle which that people had for their liberty: for the Spaniards having forbidden all commerce with them, and ſhut up all their ports, neceſſity inſpired ſome Zealanders to ſeek a north-eaſt paſſage to China.

This enterpriſe proving unſucceſsful to three ſeveral armaments in 1594, 1595, and 1596, a ſecond company was formed, under the name of the *Company of remote Parts;* which, in 1597, took the ordinary route of the Portugueſe to the Indies, and returned in two years and a half's time with little gain but good hopes.

This company, and a new one juſt eſtabliſhed at Amſterdam, being united, equipped other fleets; and theſe occaſioned other companies at Amſterdam, Rotterdam, in Zealand, &c. inſomuch that the ſtates ſoon began to apprehend they might be prejudicial to each other. Under this concern, they called all the directors of the ſeveral companies together, who all conſented to an union, the treaty whereof was confirmed by the ſtates in 1602; a very remarkable epocha, as being that of the moſt ſolid and celebrated eſtabliſhment of commerce that ever was in the world.

Its firſt capital was ſix million ſix hundred thouſand guilders. It had ſixty directors, divided into ſeveral chambers; twenty in that of Amſterdam, twelve in that of Zealand, fourteen in that of Delft and Rotterdam, and a like number in thoſe at Sluys and Horn. As each grant expires, the company is obliged to procure a new one, which it has already done five times ſince the firſt, paying a conſiderable ſum each time. The laſt application was in 1773, when the company, after ſtating that its trade had declined, ſolicited the ſtates-general to grant a diminution of the ſum formerly paid for the renewal of the charter. Upon this repreſentation, their high mightineſſes, in order to have time to inquire into the matter, prolonged the charter for three years, upon the old eſtabliſhment; and finding, upon examination, that the company had really ſuſtained great loſſes, and its trade conſiderably declined, they acted with the ſpirit of a wiſe commercial commonwealth, by complying with the company's requeſt. They therefore, in 1776, granted them a new charter for 30 years, on the ſame terms as the former, on the immediate payment of 2,000,000 of florins, inſtead of 3,000,000 which they paid before, and the ſum of 360,000 florins yearly; which annual payment they were allowed to make either in money or merchandiſe. In conſequence of this indulgence, the ſtock of the company roſe in a ſhort time no leſs than 19 per cent.

Their factories, reſidences, &c. in the Eaſt Indies, are very numerous: reaching from the Perſian gulf to the coaſt of China: the principal is that of Batavia, the centre of their commerce; here reſides their general, with the ſtate and ſplendor of a ſovereign prince; making war and peace with the eaſtern kings and emperors at pleaſure.

The other more conſiderable factories are, Taiouam on the coaſt of China, Nangiſac in Japan, Malacca, Surat, Amboyna, Banda, Siam, Moluccas, &c. ſeveral on the coaſt of Coromandel, and at Iſpahan, Cape of Good Hope, &c.: in all, they number 40 factories and 25 fortreſſes. They have the whole trade of the ſpicery in their own hands.

2. Their *Weſt India Company* was eſtabliſhed in 1621, with an excluſive privilege to trade 24 years along the coaſts of Africa, between the tropic of Cancer and the Cape of Good Hope; and in America from the ſouth point of Newfoundland, through the ſtraits of Magellan, that of Le Maire, or others, to the ſtraits of Anian, both in the North and South ſea. The directors are divided into five chambers (as in the Eaſt India company), out of which 19 are choſen for the general direction of affairs. In 1647, the company renewed its grant for 25 years; but it was ſcarce able to hold out the term, on account of its great loſſes and expences in taking the bay of Todos los Santos, Fernambuc, and the greateſt part of Braſil, from the Portugueſe. The weakneſs of this company, which had ſeveral times in vain attempted to be joined to that of the Eaſt Indies, occaſioned its diſſolution at the expiration of its grant.

In 1674, a new company, compoſed of the ancient proprietors and their creditors, was ſettled in the ſame rights and eſtabliſhment with the former; and ſtill ſubſiſts, though conſiderably decayed. Their firſt capital was about ſix millions of florins. Its principal eſtabliſhments are, one at Cape Verd, another on the Gold Coaſt of Africa, at Tobago, Curaſſao, &c. in America.

II. FRENCH Companies. 1. Their *Eaſt India Company* was eſtabliſhed in 1664, with an excluſive privilege to trade for 50 years in all the ſeas of the Eaſt Indies and South Sea. No adventurer to be admitted without 1000 livres in ſtock; and foreigners who have 20,000 livres in ſtock to be reputed regnicoles.

The patent grants them the iſland of Madagaſcar; and the king to be at one-fifth of the expence of the three firſt armaments, without intereſt; the principal to be refunded in ten years; or, if the company find it loſes on the whole, the loſs to fall on the king's ſide.

The capital fund of the company, which was moſtly furniſhed by the king, was ſeven or eight millions of livres, but was to have been fifteen millions.

In effect, though no means were wanting to ſupport the company, yet it ſtill drooped and ſtill ſtruggled; till having ſubſiſted ten years without any change in its form, and being no longer able to diſcharge its engagements, there were new regulations concerted, but to little purpoſe. At length, things not being diſpoſed for a new Eaſt India Company, nor much good to be expected from the old one, in 1708 the miniſter allowed the directors to treat with the rich traders of St Malo, and reſign to them their privilege under certain conditions. In the hands of theſe laſt, the company began to flouriſh. See *India Company*, below.

Its chief factory is at Pondicherry, on the coaſt of Coromandel. This is the reſidence of the director-general. The other factories are inconſiderable. The merchandiſes which the company brings into France are, ſilks, cottons, ſpices, coffee, rice, ſaltpetre; ſeveral kinds of gums and drugs, woods, wax, printed calicoes, muſlins, &c.

2. Their *Weſt India Company* was eſtabliſhed in 1664. Their charter gave them the property and ſeignory of Canada, Acadia, the Antilles iſlands, iſle of Cayenne, and the Terra Firma of America, from the river of the Amazons to that of Oroonoko; with an excluſive privilege for the commerce of thoſe places, as alſo of Senegal and the coaſts of Guinea, for 40 years, only paying half the duties. The ſtock of the company was ſo conſiderable, that in leſs than ſix months 45 veſſels were equipped; with which they took poſſeſſion of all the places in their grant, and ſettled a commerce: yet this only ſubſiſted nine years. In 1674, the grant was revoked, and the countries above reunited to the king's dominions as before: the king reimburſing the actions of the adventurers. This revocation was owing partly to the poverty of the company, occaſioned by its loſſes in the wars with England, which had neceſſitated it to borrow above a million, and even to alienate its excluſive privilege for the coaſts of Guinea: and partly to its having in good meaſure anſwered its end: which was to recover the commerce of the Weſt Indies from the Dutch, who had torn it from them: for the French merchants, being now accuſtomed to traffic to the Antilles, by permiſſion of the company, were ſo attached to it, that is was not doubted they would ſupport the commerce after the diſſolution of the company.

3. Their *Miſſiſſippi Company* was firſt eſtabliſhed in 1684 in favour of the Chevalier de la Salle; who having projected it in 1660, and being appointed governor of the fort of Frontignac at the mouth of that river, travelled over the country in the year 1683, and returned to France to ſolicit the eſtabliſhment. This obtained, he ſet ſail for his new colony with four veſſels laden with inhabitants, &c. but entering the gulf of Mexico, he did not, it ſeems, know the river that had coſt him ſo much fatigue, but ſettled on another river unknown, where his colony periſhed by degrees; ſo that in 1685 there were not 100 perſons remaining. Making ſeveral expeditions to find the Miſ-

ſiſſippi, he was killed in one of them by a party who mutinied againſt him; whereupon the colony was diſperſed and loſt. M. Hiberville afterwards ſucceeded better. He found the Miſſiſſippi, built a fort, and ſettled a French colony there; but he being poiſoned, it is ſaid, by the intrigues of the Spaniards, who feared ſuch a neighbour, in 1712 M. Crozat had the whole property of trading to the French territories called *Louiſiana* granted him for 15 years.

4. *Company of the Weſt.* In 1717, the Sieur Crozat ſurrendered his grant; and in the ſame year a new company was erected under the title of *Company of the Weſt*: to which, beſides every thing granted to the former company, was added the commerce of beaver, enjoyed by the Canada company from the year 1706, but expiring in 1717. In this eſtabliſhment, an equal view was had to the finances and the commerce of the nation; and, accordingly, part of the conditions of its eſtabliſhment regarded the ſettling a colony, a trade, &c. the other the vending part of the bills, called *bills of ſtate*, which could no longer ſubſiſt on their preſent footing. The former are no more than are uſual in ſuch eſtabliſhments: for the latter, the actions are fixed at 500 livres, each payable in bills of ſtate; the actions to be eſteemed as merchandiſe, and in that quality to be bought, ſold, and trafficked. The bills of ſtate, which make the fund of the actions, to be converted into yearly revenue. To put the finiſhing hand to the company, in 1717 its fund was fixed at an hundred millions of livres; which being filled, the caſh was ſhut up.

5. *India Company.* The junction of the former company with that of Canada was immediately followed by its union with that of Senegal, both in the year 1718, by an arret of council: which at the ſame time granted the new company the commerce of beavers, and made it miſtreſs of the negro or Guinea trade to the French colonies in America.

Nothing was now wanting to its perfection but an union with the Eaſt India company, and with thoſe of China and St Domingo; which was effected, with the two firſt in 1719, and with the third in 1720. This union of the Eaſt India and China company with the company of the Weſt, occaſioned an alteration of the name; and it was henceforth called the *India Company*.

The reaſons of the union were, the inability of the two former to carry on their commerce; the immenſe debts they had contracted in the Indies, eſpecially the Eaſt Company, complaints whereof had been ſent to court by the Indians, which diſcredited the company ſo that they durſt not appear any longer at Surat; the little care they took to diſcharge their engagements; and their having transferred their privilege to the private traders of St Malo, in conſideration of a tenth in the profits of the returns of their ſhips.

The ancient actions of the company of the Weſt, which were not at par when this engraftment was projected, before it was completed, were riſen to 300 per cent.; which unexpected ſucceſs gave occaſion to conclude the new actions of the united companies would not bear leſs credit. The concourſe of ſubſcribers was ſo great, that in a month's time there were above fifty millions ſubſcribed for: the firſt twenty-five million actions which were granted to the India company, beyond the hundred millions of ſtock allowed the company of the Weſt, being filled as ſoon as the books were opened; to ſatisfy the earneſtneſs of the ſubſcribers, the ſtock was increaſed by ſeveral arrets to three hundred millions. Credit ſtill increaſing, the new actions roſe to 1200 per cent. and thoſe of the ancient company of the Weſt to 1900 per cent.; an exorbitant price, to which no other company ever roſe. Its condition was now ſo flouriſhing, that in 1719 it offered the king to take a leaſe of all his farms for nine years, at the rate of three millions five hundred thouſand livres per annum more than had been given before; and alſo to lend his majeſty twelve hundred millions of livres to pay the debts of the ſtate. Theſe offers were accepted; and the king, in conſideration hereof, granted them all the privileges of the ſeveral grants of the companies united to that company to the year 1770; on condition, however, of diſcharging all the debts of the Old Eaſt India Company, without any deduction at all. The loan of twelve hundred millions not being ſufficient for the occaſion of the ſtate, was augmented, three months afterwards, with three hundred millions more; which, with the former loan, and another of one hundred millions before, made ſixteen hundred millions, for which the king was to pay intereſt at the rate of three per cent.

The duke of Orleans, in February 1720, did the company the honour to preſide in their aſſembly, where he made ſeveral propoſals to them on the part of the king: the principal of theſe was, that they ſhould take on them the charge and adminiſtration of the royal bank. This was accepted of: and Mr Law, comptroller-general of the finances, was named by the king inſpector-general of the India Company and bank united.

This union, which, it was propoſed, ſhould have been a mutual help to both thoſe famous eſtabliſhments, proved the fatal point from whence the fall of both commenced: from this time, both the bank bills and the actions of the company began to fall. In effect, the firſt periſhed abſolutely, and the other had been drawn along with it but for the prudent precautions taken for its ſupport.

The firſt precaution was the revoking the office of inſpector-general, and the obliging Mr Law to quit the kingdom; the ancient directors were diſcarded, and new ones ſubſtituted; and, to find the bottom of the company's affairs, it was ordered they ſhould give an account of what they had received and diſburſed, both on the account of the company and of the bank, which they had had the management of near a year. Another precaution to come at the ſtate of the company was, by endeavouring to diſtinguiſh the lawful actionaries from the Miſſiſſippi extortioners; whoſe immenſe riches, as well as their criminal addreſs in realizing their actions either into ſpecie or merchandiſe, were become ſo fatal to the ſtate; in order, if poſſible, to ſecure the honeſt adventurers in their ſtock. To this end, an inquiſition was made into their books, &c. by perſons appointed by the king: and the new directors, or, as they were called, *regiſſeurs*, began ſeriouſly to look about for their commerce abroad. Their affairs, however, declined, and at length ſunk into a ruined and bankrupt ſtate about the year 1769. The king immediately ſuſpended their excluſive privileges, and laid the trade to the Eaſt open to all his ſubjects; conſigning, at the ſame time, the affairs of the company to the care of the miniſtry to adjuſt and ſettle. But the various ſchemes which were then formed for the reſtoration of the old company, and the eſtabliſhment of a new one, were accompanied with ſuch inſurmountable difficulties, as to prove wholly ineffectual. Nor was the laying open of the trade attended immediately with the ſucceſs that was expected; the merchants being very ſlow in engaging in it, though the king, by way of encouragement, lent them ſome of his own ſhips to convey their commodities to the Eaſt; and the garriſon and civil eſtabliſhments continued to be ſupported in their exiſting form by the crown. The meaſure, however, proved in time ſucceſsful; ſo that for a courſe of years previous to 1785, the annual importation from India was conſiderably greater than during any former period. But whether it was that they regarded this proſperity as precarious; or aimed at a more extenſive ſucceſs; or that they wiſhed, in imitation of Britain, for territorial acquiſitions in that climate, and believed an incorporated ſociety the beſt inſtrument of obtaining them; the French court was induced to liſten to propoſals for eſtabliſhing a new Eaſt India Company. Their privilege was for ſeven years, with the ſpecial proviſo, that years of war which might occur in the interim ſhould be excluded from the computation.

In the preamble of the act of the 14th April 1785, by which the ſcheme was adopted, it was alleged, "that the commodities of Europe not having of late years been regulated by any common ſtandard, or proportioned to the demands of India, had on the one hand ſold at a low price; while, on the other, the competition of the ſubjects of France had raiſed the price of the objects of importation: that, upon their return home, a want of ſyſtem and aſſortment had been univerſally complained of, the market being overſtocked with one ſpecies of goods, and totally deſtitute of another; that theſe defects muſt neceſſarily continue as long as the trade remained in private hands; and that, on their account, as well as that of the capital required, the eſtabliſhment of a new company was abſolutely neceſſary."

Theſe reaſonings did not appear altogether ſatisfactory to the perſons principally intereſted. France has been ſo far enlightened by the diſcuſſions of the excellent writers ſhe has produced upon queſtions of politics and commerce, as not to be prepared to behold the introduction of monopolies with a very favourable eye. By many perſons it was remarked, that the arguments of the preamble did not apply more to the trade of India than to any other trade; and that, if they were admitted in their entire force, they were calculated to give a finiſhing blow to the freedom of commerce. The capital of the new company, which amounted to 830,000l. was ridiculed as altogether inadequate to the magnitude of the undertaking. The privileges with which it was indulged were treated as enormous. The monopoly of Eaſt India goods imported into France from any part of Europe, was granted to them for two years, as well as the monopoly of Eaſt India goods imported from the place of their growth. It was ſaid, that during that period they would fit out no adventures for India; that they hoped to obtain a prolongation of this injurious indulgence; and that, of conſequence, their incorporation was in reality a conſpiracy to prevent all future communication between France and the ſources of commerce in Aſia. A proviſion in the act, directing that the prices of Eaſt India goods in the iſlands of Mauritius and Bourbon ſhould be regulated by a tariff to be fixed by the court of Verſailles, excited ſtill louder exclamations. In this inſtance, it was ſaid, the firſt principles of commerce were trampled upon in a manner the moſt wanton and abſurd. Inſtead of ſuffering it to find its own level by the mutual colliſion of the wants of one party and the labour of another, it was arbitrarily to be faſhioned by a power whoſe extreme diſtance muſt neceſſarily render its deciſions ill-timed and inapplicable. The very mode in which the monopoly was introduced was a ſubject of complaint. It was determined by a reſolution of the king in council; a proceeding totally inadequate to the importance of the ſubject, and which was to be regarded as clandeſtine and ſurreptitious. In all former inſtances ſuch meaſures aſſumed the form of edicts, and were regiſtered in the parliaments. It was the prerogative of theſe courts to verify them; that is, to inquire into the facts which had led to their adoption. The injured parties had an opportunity of being heard before the privilege aſſumed the form of a law; not privately by the miniſters of the ſovereign, but publicly by the moſt conſiderable bodies in the kingdom, and in the face of the nation.

The act of council eſtabliſhing a new Eaſt India Company, was followed on the tenth of June by another declaration, intended ſtill farther to promote their intereſt; by which it was expreſsly forbidden to import cottons, printed linens, and muſlins, except through the medium of the company. The arret proceeds upon the ſame principles of monopoly as in the former inſtance. It ſets out indeed with a declaration, "that nothing can appear more deſirable to the king, or better accord with the ſentiments of his heart, than a general liberty, that freeing at once the circulation of commodities from every ſpecies of reſtraint, ſhould ſeem to make of all the people of the world but one nation with reſpect to commerce." But it adds, "that the period of this liberty is not yet arrived: that it muſt either be, with reſpect to the nations of Europe, unlimited and reciprocal, or that it cannot be admitted: that the revocation of the former indulgence reſpecting cottons and linens was become neceſſary on account of the opportunities it created for contraband trade; and becauſe the competition of the Eaſt India Company and private traders would occaſion a ſurplus in the market, and the admiſſion of foreign manufactures would decreaſe and annihilate the national induſtry."

The proviſions that were made for carrying this law into effect were conſidered as unjuſt and ſevere. The merchants poſſeſſing any of the prohibited commodities were allowed twelve months to diſpoſe of them; but upon the expreſs condition, that the commodities were to bear a ſtamp, importing that they were vendible only to a certain period; a circumſtance that muſt neceſſarily depreciate their value. It was alſo enacted, that the houſe of any trader might be entered by day or by night, at the ſolicitation of the directors, to ſearch for prohibited goods, which were to be confiſcated to the uſe of the company. Theſe kinds of viſits of the officers of revenue, hitherto unauthorized in France, were repreſented as peculiarly obnoxious, when they were made for the ſole benefit of a privileged monopoly.

COMPANY, in military affairs, a ſmall body of foot, commanded by a captain, who has under him a lieutenant and enſign.

The number of ſentinels or private ſoldiers in a company is from 50 to 100; and a battalion or regiment conſiſts of 9, 10, or 11, ſuch companies, one of which is always grenadiers, and poſted on the right; next them ſtands the colonel's company, and on the left the light infantry company. Companies not incorporated into regiments are called *irregulars*, or *independent companies*.

Artillery COMPANY. See ARTILLERY.

COMPANY *of Ships*, a fleet of merchantmen, who make a charter-party among themſelves; the principal conditions whereof uſually are, that certain veſſels ſhall be acknowledged admiral, vice-admiral, and rear-admiral; that ſuch and ſuch ſignals ſhall be obſerved; that thoſe which bear no guns ſhall pay ſo much per cent. of their cargo; and in caſe they be attacked, that what damages are ſuſtained ſhall be reimburſed by the company in general. In the Mediterranean, ſuch companies are called *conſerves*.

COMPARATIVE ANATOMY, is that branch of anatomy which conſiders the ſecondary objects, or the bodies of other animals; ſerving for the more accurate diſtinctions of ſeveral parts, and ſupplying the defect of human ſubjects.

It is otherwiſe called *the anatomy of beaſts*, and ſometimes *zootomy*; and ſtands in contradiſtinction to human anatomy, or that branch of the art which conſiders the human body the primary object of anatomy. See ANATOMY.

COMPARATIVE *Degree*, among grammarians, that between the poſitive and ſuperlative degrees, expreſſive of any particular quality above or below the level of another.

COMPARISON, in a general ſenſe, the conſideration of the relation between two perſons or things, when oppoſed to each other, by which we judge of their agreement or difference.

COMPARISON *of Ideas*, an act of the mind, whereby it compares its ideas one with another, in reſpect of extent, degree, time, place, or any other circumſtances. See IDEA.

Brutes ſeem not to have this faculty in any great degree: they have, probably, ſeveral ideas diſtinct enough; but cannot compare them farther than as to ſome ſenſible circumſtances annexed to the objects themſelves; the power of comparing general ideas, which we obſerve in men, we may probably conjecture they have not at all.

COMPARISON, in *Grammer*, the inflection of the comparative degree. See GRAMMAR.

COMPARISON, in *Rhetoric*, is a figure whereby two things are conſidered with regard to ſome third, which is common to them both.

Inſtruction is the principal, but not the only end of compariſon. It may be employed with ſucceſs in putting a ſubject in a ſtrong point of view. A lively idea is formed of a man's courage by likening it to that of a lion; and eloquence is exalted in our imagination comparing it to a river overflowing its banks, and involving all in its impetuous courſe. The ſame effect is produced by contraſt: a man in proſperity becomes more ſenſible of his happineſs, by comparing his condition with that of a perſon in want of bread. Thus compariſon is ſubſervient to poetry as well as to philoſophy.

Compariſons ſerve two purpoſes: when addreſſed to the underſtanding, their purpoſe is to inſtruct; when to the heart, their purpoſe is to pleaſe. Various means contribute to the latter: 1ſt, The ſuggeſting ſome unuſual reſemblance or contraſt*; 2d, The ſetting an object in the ſtrongeſt light; 3d, The aſſociating an object with others that are agreeable; 4th, The elevating an object; and 5th, The depreſſing it. And that compariſons may give pleaſure by theſe various means, will be made evident by examples which ſhall be given, after premiſing ſome general obſervations.

Objects of different ſenſes cannot be compared together; for ſuch objects are totally ſeparated from each other, and have no circumſtance in common to admit either reſemblance or contraſt. Objects of hearing may be compared together, as alſo of taſte, of ſmell, and of touch; but the chief fund of compariſon are objects of ſight; becauſe in writing or ſpeaking, things can only be compared in idea, and the ideas of ſight are more diſtinct and lively than thoſe of any other ſenſe.

When a nation emerging out of barbarity begins to think of the fine arts, the beauties of language cannot long lie concealed; and when diſcovered, they are generally, by the force of novelty, carried beyond all bounds of moderation. Thus, in the earlieſt poems of every nation, we find metaphors and ſimiles founded on the ſlighteſt and moſt diſtant reſemblances, which, loſing their grace with their novelty, wear gradually out of repute; and now, by the improvement of taſte, no metaphor nor ſimile is admitted into any polite compoſition but of the moſt ſtriking kind. To illuſtrate this obſervation, a ſpecimen ſhall be given afterward of ſuch metaphors as we have been deſcribing: with reſpect to ſimiles take the following ſpecimen:

> “ Behold, thou art fair, my love: thy hair is as
> “ a flock of goats that appear from Mount Gilead:
> “ thy teeth are like a flock of ſheep from the waſh-
> “ ing, every one bearing twins: thy lips are like
> “ a thread of ſcarlet: thy neck like the tower of
> “ David built for an armoury, whereon hang a
> “ thouſand ſhields of mighty men: thy two breaſts
> “ like two young roes that are twins, which feed
> “ among the lilies: thy eyes like the fiſh-pools in
> “ Heſbon, by the gate of Bath-rabbim: thy noſe
> “ like the tower of Lebanon, looking toward Da-
> “ maſcus.” *Song of Solomon.*

> “ Thou art like ſnow on the heath; thy hair like
> “ the miſt of Cromla, when it curls on the rocks
> “ and ſhines to the beam of the weſt: thy breaſts

* See the article RESEMBLANCE *and Diſſimilitude.*

"are like two ſmooth rocks ſeen from Branno of "the ſtreams: thy arms like two white pillars in "the hall of the mighty Fingal." *Fingal.*

It has no good effect to compare things by way of ſimile that are of the ſame kind; nor to contraſt things of different kinds. The reaſon is given in the article above cited on the margin, and ſhall be here illuſtrated by examples. The firſt is a compariſon built upon a reſemblance ſo obvious as to make little or no impreſſion. Speaking of the fallen angels ſearching for mines of gold:

A numerous brigade haſten'd: as when bands
Of pioneers with ſpade and pickaxe arm'd,
Forerun the royal camp to trench a field
Or caſt a rampart. *Milton.*

The next is of things contraſted that are of different kinds.

Queen. What, is my Richard both in ſhape and mind
Transform'd and weak? Hath Bolingbroke depos'd
Thine intellect? Hath he been in thy heart?
The lion, dying, thruſteth forth his paw,
And wounds the earth, if nothing elſe, with rage
To be o'erpower'd: and wilt thou, pupil like,
Take thy correction mildly, kiſs the rod,
And fawn on rage with baſe humility?
Richard II. Act v. ſc. 1.

This compariſon has ſcarce any force: a man and a lion are of different ſpecies, and therefore are proper ſubjects for a ſimile; but there is no ſuch reſemblance between them in general, as to produce any ſtrong effect by contraſting particular attributes or circumſtances.

A third general obſervation is, That abſtract terms can never be the ſubject of compariſon, otherwiſe than by being perſonified. Shakeſpeare compares adverſity to a toad, and ſlander to the bite of a crocodile; but in ſuch compariſons theſe abſtract terms muſt be imagined ſenſible beings.

To have a juſt notion of compariſons, they muſt be diſtinguiſhed into two kinds; one common and familiar, as where a man is compared to a lion in courage, or to a horſe in ſpeed; the other more diſtant and refined, where two things that have in themſelves no reſemblance or oppoſition, are compared with reſpect to their effects. There is no reſemblance between a flower-pot and a cheerful ſong; and yet they may be compared with reſpect to their effects, the emotions they produce in the mind being extremely ſimilar. There is as little reſemblance between fraternal concord and precious ointment; and yet obſerve how ſucceſsfully they are compared with reſpect to the impreſſions they make.

"Behold, how good and how pleaſant it is for "brethren to dwell together in unity. It is like "the precious ointment upon the head, that ran "down upon Aaron's beard, and deſcended to the "ſkirts of his garment." *Pſalm* 133.

For illuſtrating this ſort of compariſon, we ſhall add ſome more examples:

"Delightful is thy preſence, O Fingal! it is like "the ſun on Cromla, when the hunter mourns his "abſence for a ſeaſon, and ſees him between the "clouds.

"Did not Oſſian hear a voice? or is it the ſound "of days that are no more? Often, like the evening "ſun, comes the memory of former times on my "ſoul.

"His countenance is ſettled from war; and is "calm as the evening-beam, that from the cloud of "the weſt looks on Cona's ſilent vale." *Fingal.*

We now proceed to illuſtrate, by particular inſtances, the different means by which compariſons, whether of the one ſort or the other, can afford pleaſure; and, in the order above eſtabliſhed, we ſhall begin with ſuch inſtances as are agreeable, by ſuggeſting ſome unuſual reſemblance or contraſt.

Sweet are the uſes of Adverſity,
Which, like the toad, ugly and venomous,
Wears yet a precious jewel in her head.
As you like it, Act ii. ſc. 1.

See, how the morning opes her golden gates,
And takes her farewel of the glorious ſun;
How well reſembles it the prime of youth,
Trimm'd like a yonker prancing to his love.
Second Part Henry VI. Act ii. ſc. 1.

Thus they their doubtful conſultations dark
Ended, rejoicing in their matchleſs chief:
As when from mountain tops, the duſky clouds
Aſcending, while the North-wind ſleeps, o'erſpread
Heav'n's cheerful face, the lowering element
Scowls o'er the darken'd landſcape, ſnow, and ſhower;
If chance the radiant ſun with farewel ſweet
Extends his ev'ning-beam, the fields revive,
The birds their notes renew, and bleating herds
Atteſt their joy, that hill and valley rings.
Paradiſe Loſt, Book ii.

None of the foregoing ſimiles tend to illuſtrate the principal ſubject, and therefore the chief pleaſure they afford muſt ariſe from ſuggeſting reſemblances that are not obvious; for undoubtedly a beautiful ſubject introduced to form the ſimile affords a ſeparate pleaſure, which is felt in the ſimiles mentioned, particularly in that cited from Milton.

The next effect of a compariſon in the order mentioned, is to place an object in a ſtrong point of view; which effect is remarkable in the following ſimiles.

As when two ſcales are charg'd with doubtful loads,
From ſide to ſide the trembling balance nods,
(While ſome laborious matron, juſt and poor,
With nice exactneſs weighs her woolly ſtore),
Till pois'd aloft, the reſting beam ſuſpends
Each equal weight; nor this nor that deſcends;
So ſtood the war, till Hector's matchleſs might,
With fates prevailing, turn'd the ſcale of fight.
Fierce as a whirlwind up the wall he flies,
And fires his hoſt with loud repeated cries.
Iliad, Book xii. 521.

——— She never told her love;
But let concealment, like a worm i' th' bud,

Feed on her damaſk cheek: ſhe pin'd in thought;
And with a green and yellow melancholy,
She ſat like Patience on a monument,
Smiling at grief. *Twelfth Night*, Act ii. ſc. 6.

" There is a joy in grief when peace dwells with
" the ſorrowful. But they are waſted with mourn-
" ing, O daughter of Toſcar, and their days are
" few. They fall away like the flower on which
" the ſun looks in his ſtrength, after the mildew
" has paſſed over it, and its head is heavy with the
" drops of night." *Fingal.*

———— Out, out, brief candle!
Life's but a walking ſhadow, a poor player,
That ſtruts and frets his hour upon the ſtage,
And then is heard no more.
Macbeth, Act v. ſc. 5.

O thou goddeſs,
Thou divine nature! how thyſelf thou blazon'ſt
In theſe two princely boys! they are as gentle
As zephrs blowing below the violet,
Not wagging his ſweet head; and yet as rough
(Their royal blood inchaf'd) as the rudeſt wind,
That by the top doth take the mountain-pine,
And make him ſtoop to the vale.
Cymbeline, Act iv. ſc. 4.

" Why did not I paſs away in ſecret, like the
" flower of the rock that lifts its fair head unſeen,
" and ſtrows its withered leaves on the blaſt?"
Fingal.

As words convey but a faint and obſcure notion of great numbers, a poet, to give a lively notion of the object he deſcribes with regard to number, does well to compare it to what is familiar and commonly known. Thus Homer compares the Grecian army in point of number to a ſwarm of bees; in another paſſage he compares it to that profuſion of leaves and flowers which appear in the ſpring, or of inſects in a ſummer's evening: And Milton,

———— As when the potent rod
Of Amram's ſon in Egypt's evil day
Wav'd round the coaſt, up call'd a pitchy cloud
Of locuſts, warping on the eaſtern wind,
That o'er the realm of impious Pharaoh hung
Like night, and darken'd all the land of Nile;
So numberleſs were thoſe bad angels ſeen,
Hov'ring on wing under the cope of hell,
'Twixt upper, nether, and ſurrounding fires.
Paradiſe Loſt, Book i.

Such compariſons have, by ſome writers, been condemned for the lowneſs of the images introduced, but ſurely without reaſon; for, with regard to numbers, they put the principal ſubject in a ſtrong light.

The foregoing compariſons operate by reſemblance; others have the ſame effect by contraſt.

York. I am the laſt of noble Edward's ſons,
Of whom thy father, prince of Wales, was firſt;
In war, was never lion rag'd more fierce;
In peace, was never gentle lamb more mild,
Than was that young and princely gentleman.
His face thou haſt, for even ſo look'd he,
Accompliſh'd with the number of thy hours,
But when he frown'd, it was againſt the French,
And not againſt his friends. His noble hand
Did win what he did ſpend; and ſpent not that
Which his triumphant father's hand had won.
His hands were guilty of no kindred's blood,
But bloody with the enemies of his kin.
Oh Richard, York is too far gone with grief,
Or elſe he never would compare between.
Richard, II. Act ii. ſc. 3.

Milton has a peculiar talent in embelliſhing the principal ſubject, by aſſociating it with others that are agreeable; which is the third end of a compariſon. Similes of this kind have, beſide, a ſeparate effect: they diverſify the narration by new images that are not ſtrictly neceſſary to the compariſon; they are ſhort epiſodes, which, without drawing us from the principal ſubject, afford great delight by their beauty and variety.

He ſcarce had ceas'd, when the ſuperior fiend
Was moving toward the ſhore; his pond'rous ſhield,
Ethereal temper, maſſy, large, and round,
Behind him caſt: the broad circumference
Hung on his ſhoulders like the moon, whoſe orb
Through optic glaſs the Tuſcan artiſt views
At evening from the top of Feſole,
Or in Valdarno, to deſcry new lands,
Rivers, or mountains, in her ſpotty globe.
Milton, Book i.

———— Thus far theſe beyond
Compare of mortal proweſs, yet obſerv'd
Their dread commander. He, above the reſt,
In ſhape and ſtature proudly eminent,
Stood like a tow'r; his form had not yet loſt
All her original brightneſs, nor appear'd
Leſs than archangel ruin'd, and th' exceſs
Of glory obſcur'd: as when the ſun new-riſen
Looks through the horizontal miſty air
Shorn of his beams; or, from behind the moon,
In dim eclipſe, diſaſtrous twilight ſheds
On half the nations, and with fear of change
Perplexes monarchs. *Milton*, Book i.

As when a vulture on Imaus bred,
Whoſe ſnowy ridge the roving Tartar bounds,
Diſlodging from a region ſcarce of prey
To gorge the fleſh of lambs, or yeanling kids,
On hills where flocks are fed, flies toward the ſprings
Of Ganges or Hydaſpes, Indian ſtreams,
But in his way lights on the barren plains
Of Sericana, where Chineſes drive
With ſails and wind their cany waggons light:
So on this windy ſea of land, the fiend
Walk'd up and down alone, bent on his prey.
Milton, Book iii.

Next of compariſons that aggrandiſe or elevate. Theſe affect us more than any other ſort; the reaſon of which will be evident from the following inſtances:

As when a flame the winding valley fills,
And runs on crackling ſhrubs between the hills,
Then o'er the ſtubble up the mountain flies,
Fires the high woods, and blazes to the ſkies,

This way and that, the ſpreading torrent roars;
So ſweeps the hero through the waſted ſhores.
Around him wide, immenſe deſtruction pours,
And earth is delug'd with the ſanguine ſhow'rs.
Iliad, xx. 569.

Methinks, King Richard and myſelf ſhould meet
With no leſs terror than the elements
Of fire and water, when their thund'ring ſhock,
At meeting, tears the cloudy cheeks of heav'n.
Richard II. Act iii. ſc. 5.

"As ruſheth a foamy ſtream from the dark ſhady ſteep of Cromla, when thunder is rolling above, and dark brown night reſts on the hill: ſo fierce, ſo vaſt, ſo terrible, ruſh forward the ſons of Erin. The chief, like a whale of ocean followed by all its billows, pours valour forth as a ſtream, rolling its might along the ſhore." *Fingal*, Book i.

"As roll a thouſand waves to a rock, ſo Swaran's hoſt came on; as meets a rock a thouſand waves, ſo Iniſfail met Swaran." *Ibid.*

The laſt article mentioned, is that of leſſening or depreſſing a hated or diſagreeable object; which is effectually done by reſembling it to any thing low or deſpicable.

Thus Milton, in his deſcription of the rout of the rebel-angels, happily expreſſes their terror and diſmay in the following ſimile:

——————————As a herd
Of goats or timorous flock together throng'd,
Drove them before him thunder-ſtruck, purſu'd
With terrors and with furies to the bounds
And cryſtal wall of heav'n, which op'ning wide,
Roll'd inward, and a ſpacious gap diſclos'd
Into the waſteful deep; the monſtrous ſight
Struck them with horror backward, but far worſe
Urg'd them behind; headlong themſelves they threw
Down from the verge of heav'n. *Milton*, Book vi.

By this time the different purpoſes of compariſon, and the various impreſſions it makes on the mind, are ſufficiently illuſtrated by proper examples. This was an eaſy work. It is more difficult to lay down rules about the propriety or impropriety of compariſons; in what circumſtances they may be introduced, and in what circumſtances they are out of place. It is evident, that a compariſon is not proper upon every occaſion; a man in his cool and ſedate moments is not diſpoſed to poetical flights, nor to ſacrifice truth and reality to the deluſive operations of the imagination; far leſs is he ſo diſpoſed, when oppreſſed with care, or intereſted in ſome important tranſaction that occupies him totally. On the other hand, it is obſerved, that a man, when elevated or animated by any paſſion, is diſpoſed to elevate or animate all his ſubjects; he avoids familiar names, exalts objects by circumlocution and metaphor, and gives even life and voluntary action to inanimate beings. In this warmth of mind, the higheſt poetical flights are indulged, and the boldeſt ſimiles and metaphors reliſhed. But without ſoaring ſo high, the mind is frequently in a tone to reliſh chaſte and moderate ornament; ſuch as compariſons that ſet the principal object in a ſtrong point of view, or that embelliſh and diverſify the narration. In general, when by any animating paſſion, whether pleaſant or painful, an impulſe is given to the imagination; we are in that condition diſpoſed to every ſort of figurative expreſſion, and in particular to compariſons. This in a great meaſure is evident from the compariſons already mentioned; and ſhall be further illuſtrated by other inſtances. Love, for example, in its infancy, rouſing the imagination, prompts the heart to diſplay itſelf in figurative language, and in ſimiles:

Troilus. Tell me, Apollo, for thy Daphne's love,
What Creſſida is, what Pandar, and what we?
Her bed is India, there ſhe lies a pearl:
Between our Ilium, and where ſhe reſides,
Let it be call'd the wild and wandering flood;
Ourſelf the merchant, and this ſailing Pandar
Our doubtful hope, our convoy and our bark.
Troilus and Creſſida, Act i. ſc. 1.

Again:

Come, gentle night; come, loving black-brow'd night!
Give me my Romeo: and, when he ſhall die,
Take him and cut him out in little ſtars,
And he will make the face of heav'n ſo fine,
That all the world ſhall be in love with night,
And pay no worſhip to the gariſh ſun.
Romeo and Juliet, Act. iii. ſc. 4.

But it will be a better illuſtration of the preſent head, to give examples where compariſons are improperly introduced. Similes are not the language of a man in his ordinary ſtate of mind, diſpatching his daily and uſual work: for that reaſon, the following ſpeech of a gardener to his ſervant is extremely improper:

Go, bind thou up yon dangling apricots,
Which, like unruly children, make their ſire
Stoop with oppreſſion of their prodigal weight:
Give ſome ſupportances to the bending twigs.
Go thou, and, like an executioner,
Cut off the heads of too faſt growing ſprays,
That look too lofty in our commonwealth:
All muſt be even in our government.
Richard II. Act iii. ſc. 7.

The fertility of Shakeſpeare's vein betrays him frequently into this error.

Rooted grief, deep anguiſh, terror, remorſe, deſpair, and all the ſevere diſpiriting paſſions, are declared enemies, perhaps not to figurative language in general, but undoubtedly to the pomp and ſolemnity of compariſon. Upon this account, the ſimile pronounced by young Rutland, under terror of death from an inveterate enemy, and praying mercy, is unnatural;

So looks the pent-up lion o'er the wretch
That trembles under his devouring paws;
And ſo he walks inſulting o'er his prey,
And ſo he comes to rend his limbs aſunder.
Ah, gentle Clifford, kill me with thy ſword,
And not with ſuch a cruel threat'ning look.
Third Part Henry VI. Act i. ſc. 5.

A man ſpent and diſpirited after loſing a battle is not diſpoſed to heighten or illuſtrate his diſcourſe by ſimiles.

York. With this we charg'd again: but out! alas,
We bodg'd again; as I have ſeen a ſwan
With bootleſs labour ſwim againſt the tide,
And ſpend her ſtrength with over-matching waves.
Ah! hark, the fatal followers do purſue,
And I am faint and cannot fly their fury.
The ſands are number'd that make up my life;
Here muſt I ſtay, and here my life muſt end.
Third Part Henry VI. Act i. ſc. 6.

Similes thus unſeaſonably introduced are finely ridiculed in the Rehearſal.

" *Bayes.* Now here ſhe muſt make a ſimile.
" *Smith.* Where's the neceſſity of that, Mr Bayes?
" *Bayes.* Becauſe ſhe's ſurpriſed; that's a general rule; you muſt ever make a ſimile when you are ſurpriſed; 'tis a new way of writing."

A compariſon is not always faultleſs, even where it is properly introduced. A compariſon, like other human productions, may fall ſhort of its end; of which defect inſtances are not rare even among good writers: and to complete the preſent ſubject, it will be neceſſary to make ſome obſervations upon ſuch faulty compariſons. Nothing can be more erroneous than to inſtitute a compariſon too faint: a diſtant reſemblance or contraſt fatigues the mind with its obſcurity, inſtead of amuſing it; and tends not to fulfil any one end of a compariſon. The following ſimiles ſeem to labour under this defect.

K. Rich. Give me the crown.—Here, couſin, ſeize the crown,
Here on this ſide, my hand; on that ſide, thine.
Now is this golden crown like a deep well,
That owes two buckets, filling one another;
The emptier ever dancing in the air,
The other down, unſeen, and full of water;
That bucket down, and full of tears, am I,
Drinking my griefs, whilſt you mount up on high.
Richard II. Act iv. ſc. 3.

K. John. Oh! couſin, thou art come to ſet mine eye;
The tackle of my heart is crack'd and burnt;
And all the ſhrouds wherewith my life ſhould ſail,
Are turned to one thread, one little hair:
My heart hath one poor ſtring to ſtay it by,
Which holds but till thy news be uttered.
King John, Act iv. ſc. 10.

York. My uncles both are ſlain in reſcuing me:
And all my followers to the eager foe
Turn back, and fly like ſhips before the wind,
Or lambs purſu'd by hunger-ſtarved wolves.
Third Part Henry VI. Act i. ſc. 6.

The latter of the two ſimiles is good: the former, becauſe of the faintneſs of the reſemblance, produces no good effect, and crowds the narration with an uſeleſs image.

In an epic poem, or in any elevated ſubject, a writer ought to avoid raiſing a ſimile upon a low image, which never fails to bring down the principal ſubject. In general, it is a rule, that a grand object ought never to be reſembled to one that is diminutive, however delicate the reſemblance may be: for it is the peculiar character of a grand object to fix the attention, and ſwell the mind; in which ſtate, it is diſagreeable to contract the mind to a minute object, however elegant. The reſembling an object to one that is greater, has, on the contrary, a good effect, by raiſing or ſwelling the mind; for one paſſes with ſatisfaction from a ſmall to a great object; but cannot be drawn down, without reluctance, from great to ſmall. Hence the following ſimiles are faulty.

Meanwhile the troops beneath Patroclus' care,
Invade the Trojans, and commence the war.
As waſps, provok'd by children in their play,
Pour from their manſions by the broad highway,
In ſwarms the guiltleſs traveller engage,
Whet all their ſtings, and call forth all their rage;
All riſe in arms, and with a general cry
Aſſert their waxen domes and buzzing progeny:
Thus from the tents the fervent legion ſwarms,
So loud their clamours, and ſo keen their arms.
Iliad, xvi. 312.

So burns the vengeful hornet (ſoul all o'er)
Repuls'd in vain, and thirſty ſtill of gore;
(Bold ſon of air and heat) on angry wings
Untam'd, untir'd he turns, attacks, and ſtings.
Fir'd with like ardour, fierce Atrides flew,
And ſent his ſoul with every lance he threw.
Iliad, xvii. 642.

An error oppoſite to the former, is the introducing a reſembling image, ſo elevated or great as to bear no proportion to the principal ſubject. Their remarkable diſparity, being the moſt ſtriking circumſtance, ſeizes the mind, and never fails to depreſs the principal ſubject by contraſt, inſtead of raiſing it by reſemblance: and if the diſparity be exceeding great, the ſimile takes on an air of burleſque; nothing being more ridiculous than to force an object out of its proper rank in nature, by equalling it with one greatly ſuperior or greatly inferior. This will be evident from the following compariſon.

Loud as a bull makes hill and valley ring,
So roar'd the lock when it releas'd the ſpring.
Odyſſey, xxi. 51.

Such a ſimile upon the ſimpleſt of all actions that of opening a lock, is pure burleſque.

A writer of delicacy will avoid drawing his compariſons from any image that is nauſeous, ugly, or remarkably diſagreeable; for however ſtrong the reſemblance may be, more will be loſt than gained by ſuch compariſon. Therefore we cannot help condemning, though with ſome reluctancy, the following ſimile, or rather metaphor.

O thou fond many! with what loud applauſe
Didſt thou beat heav'n with bleſſing Bolingbroke
Before he was what thou would'ſt have him be?
And now being trimm'd up in thine own deſires,
Thou, beaſtly feeder, are ſo full of him,
That thou provok'ſt thyſelf to caſt him up.
And ſo, thou common dog, didſt thou diſgorge
Thy glutton boſom of the royal Richard,
And now thou would'ſt eat thy dead vomit up
And howl'ſt to find it.
Second Part Henry IV. Act i. ſc. 6.

The ſtrongeſt objection that can lie againſt a compariſon is, that it conſiſts in words only, not in ſenſe. Such falſe coin, or baſtard-wit, does extremely well in burleſque; but it is far below the dignity of the epic, or of any ſerious compoſition.

> The noble ſiſter of Poplicola,
> The moon of Rome; chaſte as the icicle
> That's curdl'd by the froſt from pureſt ſnow,
> And hangs on Dian's temple.
>
> *Coriolanus*, Act v. ſc. 3.

There is evidently no reſemblance between an icicle and a woman, chaſte or unchaſte: but chaſtity is cold in a metaphorical ſenſe, and an icicle is cold in a proper ſenſe; and this verbal reſemblance, in the hurry and glow of compoſing, has been thought a ſufficient foundation for the ſimile. Such phantom ſimiles are mere witticiſms, which ought to have no quarter, except where purpoſely introduced to provoke laughter. Lucian, in his diſſertation upon hiſtory, talking of a certain author, makes the following compariſon, which is verbal merely.

> "This author's deſcriptions are ſo cold, that they "ſurpaſs the Caſpian ſnow, and all the ice of the "north."

> ———But for their ſpirits and ſouls
> This word *rebellion* had froze them up
> As fiſh are in a pond.
>
> *Second Part Henry IV.* Act i. ſc. 3.

Pope has ſeveral ſimiles of the ſame ſtamp.

> And hence one maſter paſſion in the breaſt,
> Like Aaron's ſerpent, ſwallows up the reſt,
>
> *Epiſt.* ii. 131.

And again talking of this ſame ruling or maſter paſſion;

> Nature its mother, habit is its nurſe;
> Wit, ſpirit, faculties, but make it worſe;
> Reaſon itſelf but gives it edge and pow'r;
> As heaven's bleſt beam turns vinegar more ſour.
>
> *Ibid.* 145.

Where the ſubject is burleſque or ludicrous, ſuch ſimiles are far from being improper. Horace ſays pleaſantly,

> *Quanquam tu levior cortice.* Lib. iii. od. 9.

And Shakeſpeare.

> In breaking oaths he's ſtronger than Hercules.

And this leads to obſerve, that beſides the foregoing compariſons, which are all ſerious, there is a ſpecies, the end and purpoſe of which is to excite gaiety or mirth. Take the following examples.

Falſtaff ſpeaking to his page:

> "I do here walk before thee, like a ſow that "hath overwhelmed all her litter but one."
>
> *Second Part Henry IV.* Act i. ſc. 10.

> "I think he is not a pick purſe, nor a horſe-"ſtealer; but for his verity in love, I do think him "as concave as a covered goblet, or a worm-eaten "nut." *As you like it*, Act iii. ſc. 10.

> This ſword a dagger had his page,
> That was but little for his age;
> And therefore waited on him ſo,
> As dwarfs upon knight-errants do.
>
> *Hudibras*, canto 1.

> "Books, like men, their authors, have but one way "of coming into the world; but there are ten thou-"ſand to go out of it, and return no more."
>
> *Tale of a Tub.*

> "The moſt accompliſhed way of uſing books at pre-"ſent is, to ſerve them as ſome do lords, learn their "*titles*, and then brag of their acquaintance."
>
> *Ibid.*

> "He does not conſider, that ſincerity in love is as "much out of faſhion as ſweet ſnuff; nobody takes it "now." *Careleſs Huſband.*

COMPARTITION, in *Architecture*, denotes the uſeful and graceful diſpoſition of the whole ground-plot of an edifice, into rooms of office, and of reception or entertainment.

COMPARTMENT, in general, is a deſign compoſed of ſeveral different figures, diſpoſed with ſymmetry, to adorn a parterre, a ceiling, &c.

A compartment of tiles or bricks, is an arrangement of them, of different colours, and varniſhed, for the decoration of a building. Compartments in gardening, are an aſſemblage of beds, plots, borders, walks, &c. diſpoſed in the moſt advantageous manner that the ground will admit of. Compartments in heraldry, are otherwiſe called *partitions*.

COMPASS, or *Mariner's Steering* COMPASS, is an inſtrument uſed at ſea by pilots to direct and aſcertain the courſe of their ſhips. It conſiſts of a circular braſs box, which contains a paper card with the 32 points of the compaſs, fixed on a magnetic needle that always turns to the north, excepting a ſmall declination variable at different places. See VARIATION.

The needle with the card turns on an upright pin fixed in the centre of the box. In the centre of the needle is fixed a braſs conical ſocket or cap, whereby the card hanging on the pin turns freely round the centre.

The top of the box is covered with a glaſs that the card's motion may not be diſturbed by the wind. The whole is encloſed in another box of wood, where it is ſuſpended by braſs hoops or gimbals, to preſerve the card horizontal. The compaſs-box is to be ſo placed in the ſhip, that the middle ſection of the box, parallel to its ſides, may be parallel to the middle ſection of the ſhip along its keel.

The compaſs being of the utmoſt conſequence to navigation, it is reaſonable to expect that the greateſt attention ſhould be paid to its conſtruction, and every attempt to improve it carefully examined, and, if proper, adopted. But ſo careleſs are the generality of commanders of this moſt uſeful inſtrument, that almoſt all the compaſſes uſed on board merchant-ſhips have their needles formed of two pieces of ſteel-wire, each of which is bent in the middle, ſo as to form an obtuſe angle; and their ends, being applied together, make an acute one; ſo that the whole repreſents the form of a lozenge; in the centre of which, and of the card, is placed the braſs cap. Now, if we examine a number of theſe cards, we ſhall rarely, if ever, find them all in the ſame direction, but they will all vary more or leſs, not only with regard to the true direction, but from one another.

Theſe irregularities are owing to the ſtructure of the needle; for the wires of which it is compoſed are only hardened at the ends; now, if theſe ends are not equally hard, or if one end be hardened up higher than the other, when they come to be put together, in fixing them to the card, that end which is hardeſt will deſtroy much of the virtue of the other; by which means the hardeſt end will have the moſt power in directing the card, and conſequently make it vary towards its own direction: and, as the wires are diſpoſed in the form of a lozenge, theſe cards can have but little force, ſo that they will often, when drawn aſide, ſtand at the diſtance of ſeveral degrees on either ſide the point from whence they are drawn: for all magnetical bodies receive an additional ſtrength by being placed in the direction of the earth's magnetiſm, and act proportionably leſs vigorouſly when turned out of it; wherefore, when theſe kind of needles are drawn aſide from their true point, two of the parallel ſides of the lozenge will conſpire, more directly than before, with the earth's magnetiſm; and the other two will be leſs in that direction; by which means the two ſides will very much impede its return; and the two latter will have that impediment to overcome, as well as the friction, by their own force alone.

To remove theſe inconveniences, ſome needles are made of one piece of ſteel of a ſpring temper, and broad towards the ends, but tapering towards the middle, where a hole is made to receive the cap. At the ends they terminate in an angle, greater or leſs according to the ſkill or fancy of the workman. Theſe needles, though infinitely preferable to the other, are, however, far from being perfect; for every needle of this form hath ſix poles inſtead of two, one at each end, two where it becomes tapering, and two at the hole in the middle: this is owing to their ſhape; for the middle part being very ſlender, it has not ſubſtance enough to conduct the magnetic ſtream quite through from one end to the other: all theſe poles appear very diſtinctly, when examined with a glaſs that is ſprinkled over with magnetic ſand. This circumſtance, however, does not hinder the needle from pointing true; but as it has leſs force to move the card than when the magnetic ſtream moves in large curves from one end to the other, it is certainly an imperfection.

Theſe inconveniences induced the ingenious Dr Knight to contrive a new ſea-compaſs, which came into uſe on board all the ſhips of war. The needle in this inſtrument is quite ſtraight, and ſquare at the ends; and conſequently has only two poles, though about the hole in the middle the curves are a little confuſed. Needles of this conſtruction, after vibrating a long time, will always point exactly in the ſame direction; and if drawn ever ſo little on one ſide, will return to it again, without any ſenſible difference. We may therefore conclude, that a regular parallelopiped is the beſt form for a needle, as well as the ſimpleſt, the holes for the caps being as ſmall as poſſible.

And as the weight ſhould be removed to the greateſt diſtance from the centre of motion, a circle of braſs, of the ſame diameter of the card, may be added, which will ſerve alſo to ſupport the card, which may then be made of thin paper, without any thing to ſtiffen it. This ring being fixed below the card, and the needle above it, the centre of gravity is placed low enough to admit of the cap being put under the needle, whereby the hole in the needle becomes unneceſſary.

The above obſervations will be eaſily underſtood from viewing the ſeveral parts of the inſtrument as repreſented on Plate CL where fig. 6. is the card with the needle KL, and its cap M, fixed upon it, being one-third of the diameter of the real card. Fig. 8. is a perſpective view of the backſide of the card, where A B repreſents the turning down of the braſs edge, C the under part of the cap, D and E two ſliding weights to balance the card, and F, G, two ſcrews that fix the braſs edge, &c. to the needle. Fig. 7. is the pedeſtal that ſupports the card, containing a ſcrewing needle, fixed in two ſmall grooves to receive it, by means of the collet C, in the manner of a port-crayon. D, the ſtem, is filed into an octagon, that it may be the more eaſily unſcrewed. For its further illuſtration and application to uſe, ſee NAVIGATION.

The invention of the compaſs is uſually aſcribed to Flavio da Melfi, or Flavio Gioia, a Neapolitan, about the year 1302; and hence it is, that the territory of Principato, which makes part of the kingdom of Naples, where he was born, has a compaſs for its arms. Others ſay that Marcus Paulus, a Venetian, making a journey to China, brought back the invention with him in 1260. What confirms this conjecture is, that at firſt they uſed the compaſs in the ſame manner as the Chineſe ſtill do; *i. e.* they let it float on a little piece of cork, inſtead of ſuſpending it on a pivot. It is added, that their emperor Chiningus, a celebrated aſtrologer, had a knowledge of it 1120 years before Chriſt. The Chineſe only divide their compaſs into 24 points. Fauchette relates ſome verſes of Guoyot de Provence, who lived in France about the year 1200, which ſeem to make mention of the compaſs under the name of *marinette*, or *mariner's ſtone*; which ſhow it to have been uſed in France near 100 years before either the Melfite or Venetian. The French even lay claim to the invention, from the *fleur de lys* wherewith all nations ſtill diſtinguiſh the north point of the card. With as much reaſon Dr Wallis aſcribes it to the Engliſh, from its name *compaſs*, by which name moſt nations call it, and which he obſerves is uſed in many parts of England to ſignify a circle.

Though the mariner's compaſs has been long in uſe, the beſt conſtruction of it was attended with many inconveniences, till the improvements which it received from the invention and experiments of Dr Knight, and the farther emendation of Mr Smeaton.

The compaſs is ſometimes obſerved to be diſturbed by the electricity of its glaſs cover; and this from ſo ſlight an application of the finger as was barely neceſſary to wipe off a little duſt. The ſame glaſs, rubbed a little more with the finger, a bit of muſlin, or paper, would attract either end of the needle ſo as to hold it to the glaſs for ſeveral minutes, far out of the due direction, according to that part of the glaſs which was moſt excited. And when the needle, after adhering to the glaſs, has dropped looſe, and made vibrations, thoſe would not be biſected as uſual by that point where the needle ſhould reſt, but would either be made all on one ſide, or be very unequally divided, by means of ſome remains of electrical virtue in that part of the glaſs which had attracted the needle, until at length, after 15 minutes or more, all the electricity being diſcharged, the magnetical power took place. The remedy for this inconvenience is to moiſten the ſurface of the glaſs; a wet finger will do it immediately and effectually. The mariner's compaſs with a chart is much leſs dangerouſly moved than the common compaſs with a bare needle; and the deeper, or farther diſtant, the needle hangs below the glaſs, the leſs diſturbance it is likely to receive.

Improved ſea-compaſſes have lately been conſtructed by Mr M‘Culloch of London, for which he obtained a patent. The particulars are as follows.

Plate CLI.

Fig. 1. is a ſection of the ſteering compaſs. *a a a a* The common wooden-box, with its lid. *b b*, The braſs compaſs-box. *c c*, The glaſs cover to ditto. *d d*, The hollow conical bottom. *e*, The prop upon which the compaſs is ſupported inſtead of gimbals; the ſpherical top of which is finely poliſhed, and the apex of the hollow cone is fitted in a peculiar manner to receive it. *f f*, A quantity of lead run round the bottom and cone of the compaſs-box, to balance and keep it ſteadily horizontal. *g g*, The card and the magnetical needle, bent in ſuch a manner that the point of the conical pivot on which it moves and is ſupported, may be brought very near to the centre of gravity, as well as to the centre of motion. *h h*, Two guards, which by means of two pins *i i*, affixed to the compaſs-box, prevents it from turning round and deceiving the ſteerſman.

Fig. 2. a perſpective view of the ſteering compaſs, with the lid off and the front laid open. *h h*, The guards. *b*, The compaſs-box. *e*, The prop, &c. as in fig. 1.

Fig. 3. a view of the azimuth compaſs. *b*, The compaſs-box. *h*, One of the guards. *e*, The prop. as in fig. 1. and 2. with this difference, that in an azimuth compaſs, inſtead of being ſcrewed to the bottom of the wood-box, it ſtands in a braſs ſocket, and may be turned round at pleaſure. 1. A braſs bar upon which the ſight-vanes are fixed. 2. A dark glaſs, which moves up and down on 3. the ſight-vane. 4. A magnifying glaſs, which is alſo moveable on the other vane. 5. The nonius or vernier. 6. A ſlide for moving the vernier ſo as to ſtop the card in taking the azimuth. 7. A double convex glaſs, by which the diviſion on the vernier may be read with accuracy.

Fig. 4. is a ſection repreſenting another application of the magnetic needle and card, conſtructed by Mr M‘Culloch. *a a a a*, The common wood-box. *b b*, The braſs compaſs-box *c c*, The braſs ſupport for the circle and pendulum. *d*, The pendulum. *e*, The agate. *f f*, The magnetic needle and card. *g g*, The braſs circle. *h h*, The glaſs cover and braſs ring. *i*, The lead weight. *N. B.* All the centres of motion are in the ſame plane.

"In one particular this patent compaſs is conſidered as an improvement on the common compaſſes, in as far as the needle is both longer and broader; hence its magnetiſm muſt be ſtronger, and of courſe the line of its magnetic direction correſpondent with the card. In another particular, in order to prevent the motions of the veſſel from affecting the needle, which is the moſt deſirable object, the patent compaſs-box, inſtead of ſwinging in gimbals at right angles to each other, is ſupported in its very centre upon a prop; and whatever motion the other parts of the box may have, this centre being in the vertex of the hollow cone, may be conſidered as relatively at reſt; and therefore gives little or no diſturbance to the needle. Again, the pivot or centre upon which the needle turns, is ſo contrived as to ſtand always perpendicular over the centre of the compaſs-box, or apex of the hollow cone, as upon a fixed point; and is therefore ſtill leſs affected by the motions of the veſſel. Thus the centres of motion, gravity, and of magnetiſm, are brought almoſt all to the ſame point; the advantages of which will be readily perceived by any perſon acquainted with mechanical principles." *M‘Culloch's Account.*

The following is a deſcription of Dr Knight's azimuth compaſs, with the improvements of Mr Smeaton. Plate CLI. fig. 6. is a perſpective view of the compaſs, when in order for obſervation; the point of view being the centre of the card, and the diſtance of the eye two feet. A B is the wooden box. C and D are two milled nuts; by means whereof the axes of the inner box and ring are taken from their edges on which they move, and the friction increaſed, when neceſſary. EF is the ring that ſupports the inner box. GH is the inner box; and I is one of its axes, by which it is ſuſpended on the ring EF. The magnet or needle appears paſſing through the centre together with a ſmall brace of ivory, that confines the cap to its place. The card is a ſingle varniſhed paper, reaching as far as the outer circle of figures, which is a circle of thin braſs; the edge whereof is turned down at right angles to the plane of the card, to make it grow ſtiff. O is a catgut line, drawn down the inſide of the box, for determining the degree upon a braſs edge. PQRS is the index bar, with its two ſtiles and catgut threads; which being taken off from the top of the box, is placed in two pieces, T and V, notched properly to receive it. W is a place cut out in the wood, ſerving as a handle.

The uſe of the azimuth compaſs is for finding the ſun's magnetical azimuth, or amplitude; and thence the variation of the compaſs. If the obſervation be for an amplitude at ſun-riſing, or for an azimuth before noon, apply the centure of the index on the weſt point of the card, within the box; ſo that the four lines on the edge of the card, and thoſe on the inſide of the box, may meet. If the obſervation be for the ſun's amplitude ſetting, or an azimuth in the afternoon, turn the centre of the index right againſt the eaſt point of the card, and make the lines within the box concur with thoſe on the card: the inſtrument thus fitted for obſervation, turn the index *b c* towards the ſun, till the ſhadow of the thread *a e* fall directly on the ſlit of the ſight, and on the line that is along the middle of the index: then will the inner edge of the index cut the degree and minute of the ſun's magnetical azimuth from the north or ſouth. But note, that if, when the compaſs is thus placed, the azimuth is leſs than 54°

from the ſouth, and the index turned towards the ſun, it will paſs off the diviſions of the limb: the inſtrument therefore in this caſe muſt be turned juſt a quarter of the compaſs, i. e. the centre of the index muſt be placed on the north or ſouth point of the card, according as the ſun is from you; and then the edge will cut the degree of the magnetic azimuth, or the ſun's azimuth from the north, as before.

The ſun's magnetical amplitude thus found, the variation of the needle is thus determined. Being out at ſea the 15th of May 1717, in 45° north latitude, the tables gave me the ſun's latitude 19° north, and his eaſt amplitude, 27° 25′ north; by the azimuth compaſs, I find the ſun's magnetical amplitude at his riſing and ſetting; and find he riſes, *e. gr.* between the 62d and 63d degree, reckoning from the north towards the eaſt point of the compaſs, i. e. between the 27th and 28th degree, reckoning from the eaſt. The magnetical amplitude, therefore, being here equal to the true one, the needle has no variation; but if the ſun at his riſing ſhould have appeared between the 52d and 53d degree from the north towards the eaſt, his magnetical amplitude would then have been between 37 and 38 degrees, i. e. about ten degrees greater than the true amplitude: therefore the needle would vary about 10 degrees north-eaſterly. If the magnetical eaſt amplitude found by the inſtrument ſhould be leſs than the true amplitude, their difference would ſhow the variation of the needle eaſterly. If the true eaſt amplitude be ſouthward, as alſo the magnetical amplitude, and this laſt be the greater; the variation of the needle will be north-weſt; and *vice verſa*.

What has been ſaid of north-eaſt amplitudes holds alſo of ſouth-weſt; and what of ſouth-eaſt amplitudes holds of north-weſt. Laſtly, if amplitudes be found of different denominations, *e. gr.* if the true amplitude be ſix degrees north, and the magnetical amplitude be ſix degrees ſouth; the variation, which in this caſe is north-weſt, will be equal to the ſum of the magnetical and true amplitudes; underſtand the ſame for weſt amplitudes.

The variation may likewiſe be found from the azimuth: but in that caſe the ſun's declination, latitude of the place, and his altitude, muſt be given, that his true azimuth may be found.

This inſtrument is alſo uſeful in ſettling the ſhip's wake, in order to find the leeway; and alſo to find the bearings of head lands and other objects.

Experience evinces, that the needle of a compaſs, like every other magnet, whether natural or artificial, continually loſes ſomething of its magnetic powers, which frequently produces a difference of more than a point; and we may venture to aſſert, that the great errors in ſhips reckonings more commonly originate from the incorrectneſs of the compaſs than from any other cauſe.

Steel cannot be too highly tempered for the needle of a ſea-compaſs, as the more it is hardened, the more permanent is the magnetiſm it receives; but to preſerve the magnetiſm, and of courſe the polarity of the needle, it ſhould be caſed with thin, well-poliſhed, ſoft iron. It has been found by repeated experiments, that the caſed needle preſerves its magnetiſm in a more perfect degree than a needle not caſed; and perhaps the magnetic power of the caſed needle may increaſe, while that of the uncaſed needle loſes of its polarity.

This is not an opinion haſtily adopted, but the reſult of a fair and judicious trial, as the gentleman from whom the above obſervations were in ſubſtance taken, placed a caſed and uncaſed needle in a room for three months, having at firſt exactly the ſame direction, and about the ſame degree of force. At the end of this period it was found that the caſed needle had not in the leaſt changed its direction, while the uncaſed had varied two degrees, and its magnetic power was conſiderably diminiſhed.

Theſe remarks have the air of novelty, and may perhaps contribute to the improvement of the compaſs. But the defects of this inſtrument are not confined to the needle. The heavieſt braſs compaſſes are not to be implicitly truſted in a hollow or high ſea, as they have the box hanging in two braſs rings, thus allowing it to have only two motions, both vertical and at right angles with each other; by which confinement of the box, upon any ſuccuſſion, particularly ſudden ones, the card is always too much agitated, and before it can recover itſelf, another jerk prevents it from pointing to the pole. It is even not uncommon to ſee the card unſhipped by the violence of the ſhip's pitching.

All theſe defects are abundantly ſupplied by giving the box a vertical motion at every degree and minute of the circle, and combining theſe motions with a horizontal one of the box as well as of the card. By this diſpoſition of the box, the effects of the jerks on the card are avoided, and it will always with ſteadineſs point to the pole. Mr Bernard Romans found by experience, that the card not only is not in the ſmalleſt degree affected by the hollow ſea, but that, in all the violent ſhocks and whirlings which it is poſſible for the box to receive, the card lies as ſtill as in a room unaffected by the leaſt motion.

A compaſs was recently invented and made in Holland having all theſe motions. It is about the ſize of the braſs compaſs commonly uſed. The bottom of the braſs box, inſtead of being ſhaped like a bowl, muſt be a hollow cone reſembling the bottom of a common glaſs bottle; the vertex of it muſt be raiſed ſo high as to leave only one inch between the card and the glaſs; the box muſt be of the uſual depth, and a quantity of lead muſt be poured in the bottom of the box, round the baſe of the cone, which ſecures it on the ſtile whereon it traverſes.

This ſtile is firmly fixed in the centre of a ſquare wooden box, like the common compaſs, but with a thicker bottom. The ſtile is made of braſs about ſix inches long, round, and one-third of an inch thick, having its head blunt like that of a ſewing thimble, and of a fine poliſh, and placed perpendicular. The inner vertex of the cone muſt likewiſe be well poliſhed. The vertical part of the cone ought to be ſufficiently thick to allow a well-poliſhed cavity for holding a ſhort ſtile, proceeding from the centre of the card on which it traverſes. "The compaſs I ſaw, (ſays Mr Romans), was ſo conſtructed; but I ſee no reaſon why the ſtile might not proceed from the centre of the vertex of the cone, and ſo be received by the card the common way. The needle muſt be a magnetic bar, blunt at each end; the glaſs and cover are put on in the common way."

The above gentleman informs us, that a ſimilar compaſs was ſubmitted to his inſpection by the captain of a ſloop of war, who declared, that during a hard gale of ſome days continuance, he had no other compaſs that was of the ſmalleſt uſe. In the opinion of Mr Romans the account was not exaggerated, in which concluſion we are diſpoſed to join iſſue with him.

Yet Mr Nicholſon in his intereſting journal is of an oppoſite ſentiment, who belives that the compaſs is very little diſturbed by tilting the box on one ſide, but very much by ſudden changes of place in a horizontal direction; that proviſion made againſt the latter in a ſcientific manner is the chief requiſite in a well conſtructed inſtrument of this nature; and that no other proviſion is neceſſary than good workmanſhip agreeably to the common conſtruction, and properly adjuſting the weight reſpecting the centres and axes of ſuſpenſion. He conceives it will improve the compaſs very much to make the needle flat and thin, and to ſuſpend it, not in the common way, with its flat ſide, but with its edge uppermoſt; for, as it is known that hard ſteel retains its magnetiſm longer than ſoft, it follows that, except both ſides of a needle be equally hard, the magnetic virtue will incline towards the harder ſide in proceſs of time.

The Chineſe compaſs has ſome advantages over the European, from which it differs in the length of the needle, and the manner of its ſuſpenſion. The needle of the Chineſe ſeldom exceeds an inch in length, and is ſcarcely a line in thickneſs. It is poiſed with great nicety, and is remarkably ſenſible. This is effected by the following contrivance.

A piece of thin copper is ſtrapped round the centre of the needle. This copper is rivetted by its edges to the upper part of a ſmall hemiſpherical cup of the ſame metal, turned downwards. The cup thus inverted ſerves as a ſocket to receive a ſteel pivot riſing from a cavity made in a round piece of light wood or cork, which forms the compaſs-box. The ſurfaces of the ſocket and pivot, intended to coincide, are highly poliſhed, to prevent friction as much as poſſible. The cup has a proportionably broad margin, which not only adds to its weight, but from its horizontal poſition tends to keep the centre of gravity in every ſituation of the compaſs, nearly coinciding with the centre of ſuſpenſion. The cavity in which the needle is ſuſpended, is circular, and little more than capable to remove the needle, cup and pivot. A thin piece of tranſparent talc is placed over the cavity, which hinders the needle from being affected by the motion of the external air; but allows the apparent motion of the former to be eaſily obſerved. The ſmall ſhort needle of the Chineſe has a ſingular advantage over thoſe commonly uſed in Europe, in reſpect of the dip towards the horizon; which, in the latter, requires that one extremity of the needle ſhould be made ſo much heavier than the other as will ſufficiently counteract the magnetic attraction. This being different in different parts of the world, the needle can only be accurately true at the place for which it has been conſtructed. But in ſhort and light needles, ſuſpended after the Chineſe manner, the weight below the point of ſuſpenſion is more than ſufficient to overcome the magnetic dip in all ſituations of the globe; and conſequently ſuch needles will never deviate from their horizontal poſition.

Compass is alſo an inſtrument of conſiderable uſe in ſurveying land, dialing, &c.

Its ſtructure, in the main, is the ſame with that of the mariner's compaſs; conſiſting like that of a box and needle: the principal difference conſiſts in this, that inſtead of the needle's being fitted into the card, and playing with it on a pivot, it here plays alone; the card being drawn on the bottom of the box, and a circle divided into 360 degrees on the limb. See fig. 5. Plate CL. This inſtrument is of obvious uſe to travellers, to direct them in their road; and to miners, to ſhow them what way to dig, with other conſiderable uſes.

1. *To take the declination of a wall by the Compaſs.* Apply that ſide of the compaſs whereon the north is marked along the ſide of the wall; the number of degrees over which the north end of the needle fixes will be the declination of the wall, and on that ſide; e. gr. if the north point of the needle tends towards the north, that wall may be ſhone on by the ſun at noon; if it fix over fifty degrees, counting from the north towards the eaſt, the declination is ſo many degrees from north towards eaſt.

But ſince the needle itſelf declines from the north towards the weſt, with us, 13°; it muſt be noted, that to retrieve the irregularity, 13° are always to be added to the degrees ſhown by the needle, when the declination of the wall is towards the eaſt; on the contrary, when the declination is towards the weſt, the declination of the needle is to be ſubtracted.

2. *To take an angle with the Compaſs.* Suppoſe the angle required be DAE, fig. 4. apply that ſide of the compaſs whereon the north is marked to one of the lines AD; when the needle reſts, obſerve the degrees at which its north point ſtands, which ſuppoſe 80: ſo many degrees does the line decline from the meridian. In the ſame manner take the declination of the line AE, which ſuppoſe 215°; ſubtract 80° from 215°, the remainder is 135°; which ſubtracted from 180°, there will remain 45°; the quantity of the angle required. But if the difference between the declination of the two lines exceed 180°; in that caſe, 180° muſt be ſubtracted from that difference; the remainder then is the angle required.

In meaſuring angles by the compaſs, there needs not any regard be had to the variation; that being ſuppoſed the ſame in all the lines of the angles.

3. *To take a plot of a field by the Compaſs.* Suppoſe the field A, B, C, D, E, fig. 10. for the greater accuracy let there be two ſights fitted to the meridian line of the compaſs; place it horizontally, and through the ſights look along the ſide AB, or a line parallel to it; applying the eye to the ſight at the ſouth point of the compaſs. Draw a rough ſketch of the field by the eye, and on the correſponding line entre down the degree to which the needle points, which ſuppoſe 90°; meaſure the length of the ſide, and enter that too, which ſuppoſe 10 chains.

In this manner proceed with all the reſt of the ſides and angles of the field; the ſides, which ſuppoſe 70, 65, 70, 44, 50 fathom; and the angles, which ſuppoſe 30, 100, 130, 240, 300 degrees. To protract the field, ſet down the ſeveral angles obſerved, one after another, and ſubtract the leſſer from the next greater: thus will you have the quantity of the ſeveral angles, and the length of the lines that include them. For the reſt, ſee GEOMETRY.

Note. All the angles of the figure taken together, muſt make twice as many right angles; abating two if no miſtake has been committed.

Azimuth COMPASS. See AZIMUTH.

COMPASS-*Dials*, are ſmall horizontal dials, fitted in braſs or ſilver boxes, for the pocket, to ſhow the hour of the day, by the direction of a needle that indicates how to place them right, by turning the dial about till the cock or ſtyle ſtands directly over the needle; but theſe can never be very exact, becauſe of the variation of the needle itſelf. See COMPASS and DIALING.

COMPASSES, or *Pair of* COMPASSES, a mathematical inſtrument for deſcribing circles, meaſuring figures, &c.

The common compaſſes conſiſt of two ſharp-pointed branches or legs of iron, ſteel, braſs, or other metal, joined together at the top by a rivet, whereon they move as on a centre. Thoſe compaſſes are of the beſt ſort in which the pin or axle on which the joint turns, and alſo half the joint itſelf, is made of ſteel, as the oppoſite metals wear more equably. The perfection of them may be known by the eaſy and uniform opening and ſhutting of their legs; one of which is ſometimes made to take in and out, in order to make room for two other points to deſcribe with ink, black-lead or other materials.

There are now uſed compaſſes of various kinds and contrivances, accommodated to the various uſes they are intended for; as,

COMPASSESS *of three legs*, or *Triangular Compaſſes*, are, ſetting aſide the exceſs of a leg, of the ſame ſtructure with the common ones; their uſe being to take three points at once, and ſo to form triangles; to lay down three poſitions of a map, to be copied at once, &c.

Beam-COMPASSES conſiſts of a long branch, or beam, made of braſs or wood, carrying two braſs curſors, the one fixed at one end, the other ſliding along the beam, with a ſcrew to faſten it occaſionally. To the curſors may be ſcrewed points of any kind, whether ſteel for pencils, or the like. It is uſed to draw large circles, to take great extents, &c. To the fixed curſor is ſometimes applied an adjuſting or micrometer ſcrew, by which an extent is obtained to extreme nicety. Mr Jones of Holborn has made beam-compaſſes to adjuſt to the $\frac{1}{5000}$dth of an inch.

Caliber COMPASSES. See CALIBER.

Clockmaker's COMPASSES are joined like the common compaſſes, with a quadrant, or bow, like the ſpring compaſſes; only of different uſe, ſerving here to keep the inſtrument firm at any opening. They are made very ſtrong, with the points of their legs of well tempered ſteel, as being uſed to draw lines on paſteboard or copper.

Cylindrical and Spherical COMPASSES, conſiſt of four branches, joined in a centre, two of which are circular, and two flat, a little bent on the ends: their uſe is to take the diameter, thickneſs, or caliber of round or cylindric bodies; ſuch as cannons, pipes, &c.

Plate CL. fig. 9.

Eliptic COMPASSES. Their uſe is to draw elipſes, or ovals of any kind: they conſiſt of a beam AB about a foot long, bearing three curſors; to one of which may be ſcrewed points of any kind: to the bottom of the other two are rivetted two ſliding dove-tails, adjuſted in grooves made in the croſs branches of the beam. The dove-tails having a motion every way, by turning about the long branch, go backwards and forwards along the croſs; ſo that when the beam has gone half-way about, one of theſe will have moved the whole length of one of the branches; and when the beam has got quite round, the ſame dove-tail has got back the whole length of the branch. Underſtand the ſame of the other dove-tail.

Note. The diſtance between the two ſliding dove-tails is the diſtance between the two foci of the elipſis; ſo that by changing that diſtance, the elipſis will be rounded or ſlenderer. Under the ends of the branches of the croſs are placed four ſteel points to keep it faſt.

The uſe of this compaſs is eaſy; by turning round the long branch, the ink, pencil, or other point, will draw the elipſis required. Its figure ſhows both its uſe and conſtruction.

German COMPASSES have their legs a little bent outwards, towards the top; ſo that when ſhut, the points only meet.

Hair COMPASSES are ſo contrived within ſide by a ſmall adjuſting ſcrew to one of the legs, as to take an extent to a hair's breadth.

Lapidary's COMPASSES are a piece of wood, in form of the ſhaft of a plane, cleft at top, as far as half its length; with this they meaſure the angles, &c. of jewels and precious ſtones, as they cut them. There is in the cleft a little braſs rule, faſtened there at one end by a pin; but ſo that it may be moved in the manner of a braſs level: with this kind of ſquare they take the angles of the ſtones, laying them on the ſhaft as they cut them.

Proportional COMPASSES are thoſe whoſe joint lies between the points terminating each leg: they are either ſimple or compound. In the former ſort the centre is fixed, ſo that one pair of theſe ſerves only for one proportion.

Plate CL. fig. 6.

Compound proportional COMPASSES conſiſt of two parts or ſides of braſs, which lie upon each other ſo nicely as to appear but one when they are ſhut. Theſe ſides eaſily open, and move about a centre, which is itſelf moveable in a hollow canal cut through the greateſt part of their length. To this centre on each ſide is affixed a ſliding piece A of a ſmall length, with a fine line drawn on it ſerving as an index, to be ſet againſt other lines or diviſions placed upon the compaſſes on both ſides. Theſe lines are 1. A line of lines. 2. A line of ſuperficies, areas, or planes. 3. A line of ſolids. 4. A line of circles, or rather of polygons to be inſcribed in circles. Theſe lines are all unequally divided; the three firſt from 1 to 20, the laſt from 6 to 20. Their uſes are as follow:

By the line of lines you divide a given line into any number of equal parts; for by placing the index A againſt 1, and ſcrewing it faſt, if you open the compaſſes, then the diſtance between the points at each end will be equal. If you place the index againſt 2, and open the compaſſes, the diſtance between the points of the longer legs BB, will be twice the diſtance between the ſhorter ones CC; and thus a line is biſected, or divided into two equal parts. If the index be placed againſt

COINING.

Plate CL.

Fig. 1.

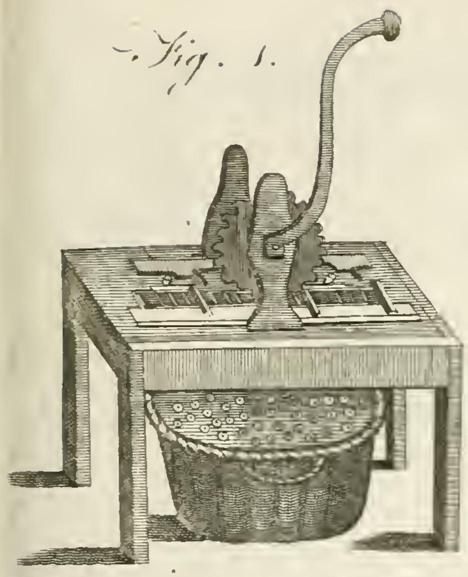


Fig. 2.

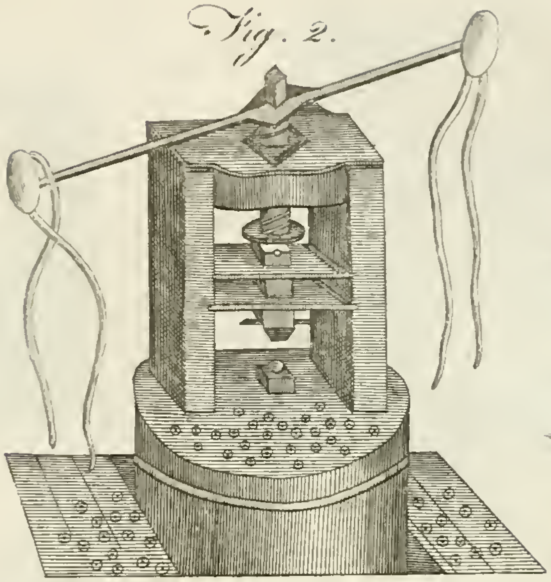
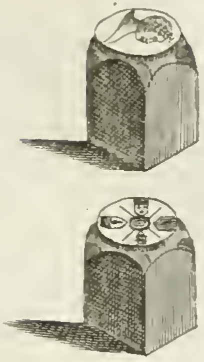


Fig. 3.



COMPASS.

Fig. 4.

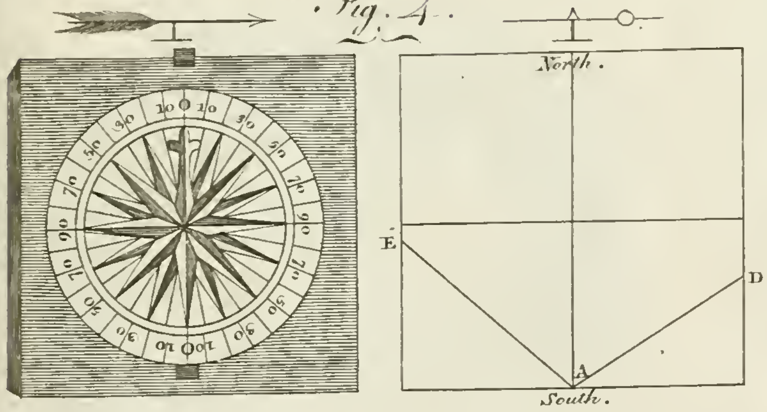


Fig. 7.

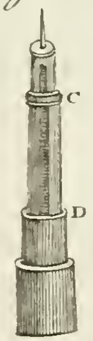


Fig. 8.

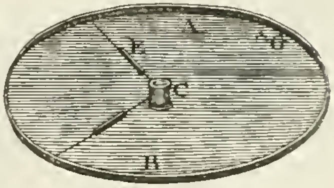


Fig. 9.

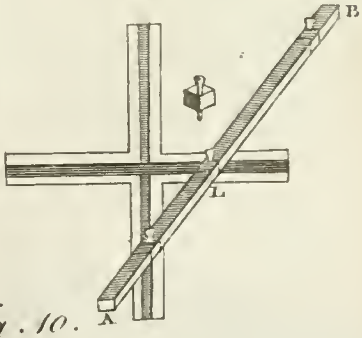


Fig. 5.

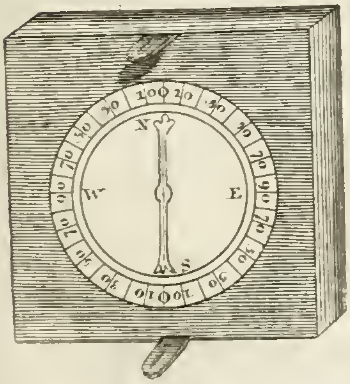


Fig. 6.

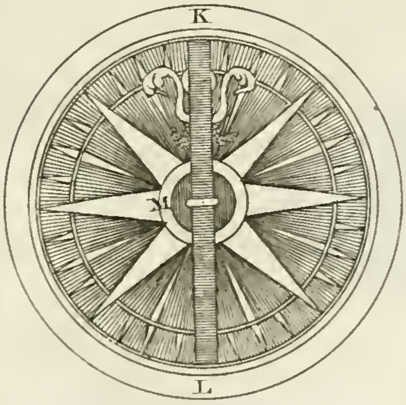
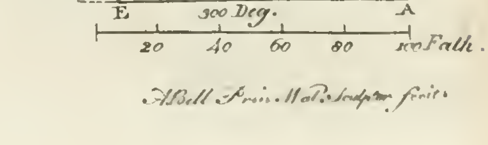


Fig. 10.



A.Bell Prin. Wal. Sculptor fecit.

Fig. 1.

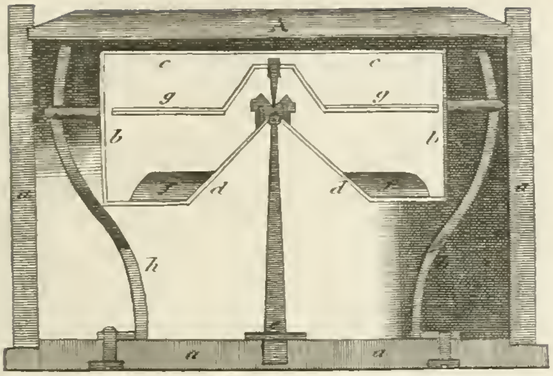


Fig. 2.

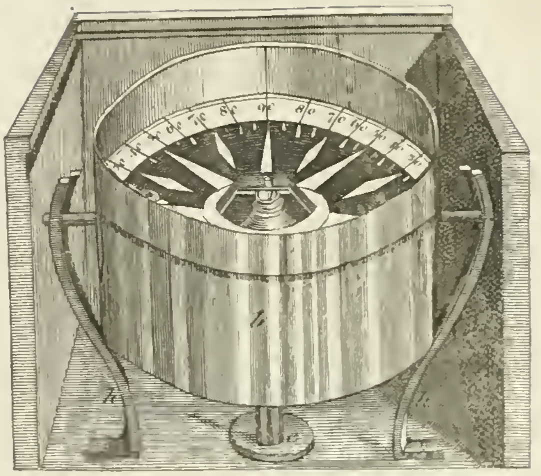


Fig. 3.

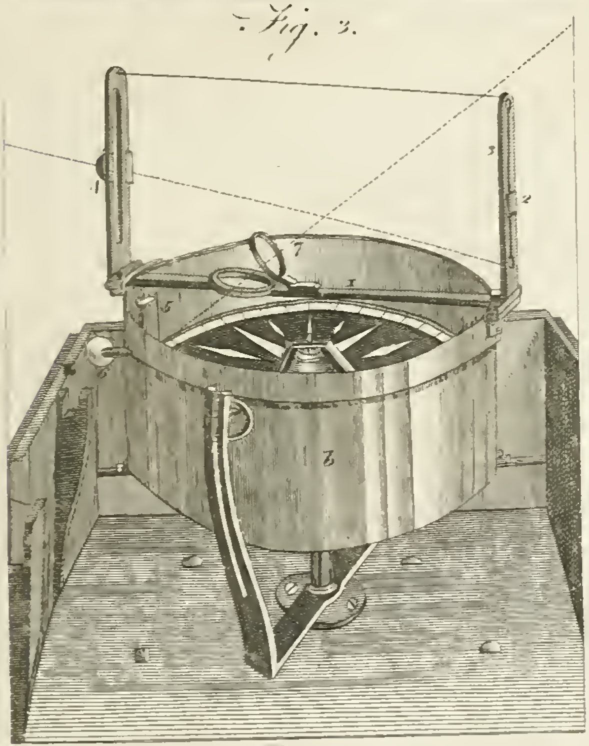


Fig. 4.

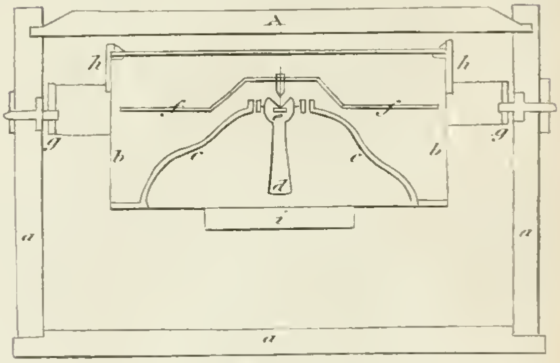


Fig. 5.

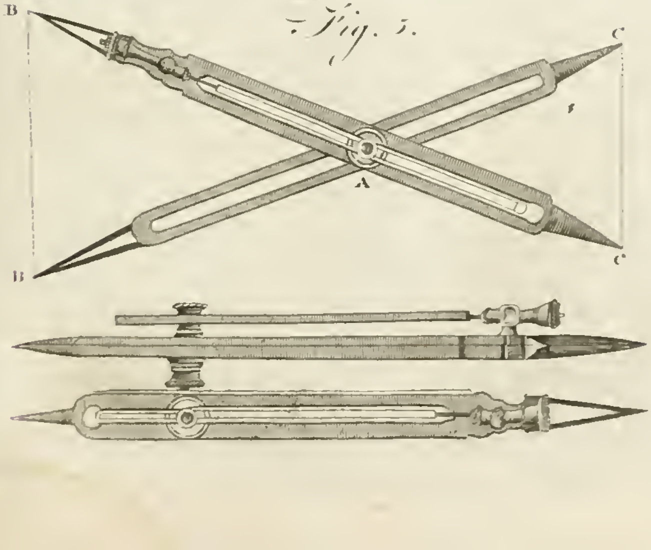
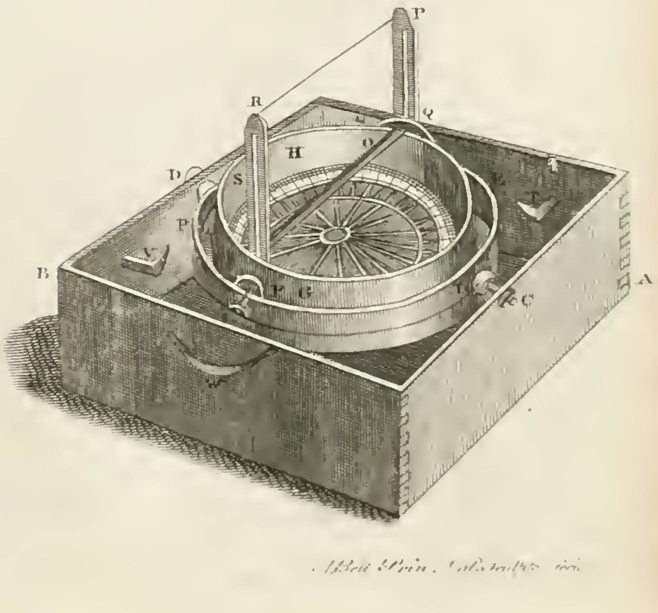


Fig. 6.



A. Bell Prin. Wal. Sculptor fecit.

againſt 3, and the compaſſes opened; the diſtances between the points will be as 3 to 1, and ſo a line is divided into 3 equal parts; and ſo you proceed for any other number of parts under 10.

The numbers of the line of planes anſwer to the ſquares of thoſe in the line of lines; for becauſe ſuperficies or planes are to each other as the ſquares of their like ſides; therefore, if the index be placed againſt 2 in the line of planes, the diſtance between the ſmall points will be the ſide of a plane whoſe area is one; but the diſtance of the larger points will be the like ſide of a plane whoſe area is two; or twice as large. If the index be placed at 3, and the compaſſes opened, the diſtances between the points at each end will be the like ſide of planes whoſe areas are as 1 to 3; and ſo of others.

The numbers of the line of ſolids anſwer to the cubes of thoſe of the line of lines; becauſe all ſolids are to each other as the cubes of their ſides or diameters: therefore, if the index be placed to number 2, 3, 4, &c. in the line of ſolids, the diſtance between the leſſer and larger points will be the like ſides of ſolids, which are to each other as 1 to 2, 1 to 3, 1 to 4, &c. For example; If the index be placed at 10, and the compaſſes be opened ſo that the ſmall points may take the diameter of a bullet whoſe weight is one ounce, the diſtance between the large points will be the diameter of a bullet or globe of 10 ounces, or which is 10 times as large.

Laſtly, The numbers in the line of circles are the ſides of polygons to be inſcribed in a given circle, or by which a circle may be divided into the equal parts, from 6 to 20. Thus, if the index be placed at 6. the points of the compaſſes at either end, when opened to the radius of a given circle, will contain the ſide of a hexagon, or divide the circle into ſix equal parts. If the index be placed againſt 7, and the compaſſes opened ſo that the larger points may take in the radius of the circle, then the ſhorter points will divide the circle into ſeven equal parts for inſcribing a heptagon. Again, placing the index to 8, and opening the compaſſes, the larger points will contain the radius, and the leſſer points divide the circle into eight equal parts for inſcribing an octagon or ſquare. And thus you may proceed for others.

Proportional Compasses *with the ſector lines.* The ſtructure of theſe is ſo like that of the common proportional compaſſes, only a little nicer, that it needs no particular deſcription. The lines on the firſt face are the line of lines, marked *lines*; it is divided into 100 equal parts, every tenth numbered: and the line of chords, which goes to 60°, is marked *chords*. On the other face are a line of ſines to 90°, and a line of tangents to 45°. On one ſide are the tangents from 45° to 71° 34′; on the other, ſecants from 0° to 70° 30′.

For the uſe of theſe compaſſes: 1. To divide a line into any number of equal parts leſs than 100: divide 100 by the number of parts required; ſlip the curſor till the line on the ſliding dove-tail be againſt the quotient on the line of lines: then, the whole line being taken between the points of the compaſſes moſt remote from the centre, the aperture of the other will ſhow the diviſion required. 2. A right line given, ſuppoſed to be divided into 100 parts, to take any number of thoſe parts; ſlip the line on the ſliding dove-tail to the number of parts required: the whole line being taken between the points fartheſt from the centre, the aperture of the other two will include the number of diviſions required. 3. The radius being given, to find the chord of any arch under 60°; ſlip the line on the ſliding dove-tail to the degrees required on the line of chords: the radius being taken between the points fartheſt from the centre of the curſor; the aperture of the other line will be the chord required, provided the number of degrees be greater than 29: if it be leſs, the aperture taken from the radius will leave the chord required. 4. If the chord of an arch under 60° be given, and the radius required; ſlip the line on the dove-tail to the degrees given on the line of chords: the given chord being taken between the two points next the curſor, the aperture of the other will be the radius required. 5. The radius being given, to find the ſine of any number of degrees; ſlip the line on the dove-tail to the degree on the line of ſines whoſe ſine is required: the radius taken between the points furtheſt from the curſor, the aperture of the other will give the ſine of the angle required. But if the ſine ſought be leſs than 30°, the difference of the apertures of the oppoſite points will be the ſine required. 6. The radius being given, to find the tangent of any number of degrees under 71: if the tangent required be under 26° 30′, then ſlip the line on the dove-tail to the degree propoſed on the tangent line; the radius taken between the points fartheſt from the curſor, the aperture of the others will be the tangent of the degrees required; if the tangent required be above 26° 30′ but under 45°, the line on the curſor muſt be ſlipped to the degrees given on the tangent line; then the radius being taken between the points furtheſt from the curſor, the aperture of the others will be the tangent. If the tangent required be greater than 45°, but leſs than 56° 20′, ſlip the notch on the tangent ſide of the turned-cheek to the degree 0 in the tangent line on the ſide of the compaſs; the radius taken between the points furtheſt from the curſor; the difference between the aperture of the other and theſe, added together, will be the tangent required. Thus, for the tangents of the degrees under 71. After the like manner may the ſecant of any number of degrees under 71 be found.

Mr Heath, a mathematical inſtrument-maker in London, conſtructed a pair of proportional compaſſes, in 1746, with a curious and uſeful contrivance for preventing the ſhorter legs from changing their poſition, when theſe compaſſes were uſed. It conſiſted of a ſmall beam ſoldered to a ſcrew, and running parallel to the leg of the compaſſes, nearly of the length of the groove; in this beam a ſlit was made, which admitted of a ſliding-nut, the other end of which fell into a hole in the bottom of the ſcrew, belonging to the great nut of the compaſſes. The ſcrew-pin of the beam paſſed through an adjuſter, by means of which the mark on the ſlider might be brought exactly to any diviſion. But the proportional compaſſes have been much out of uſe ſince the invention of the ſector.

Spring Compasses, or dividers; thoſe with an arched head, which by its ſpring opens the legs; the opening being directed by a circular ſcrew faſtened to one of the legs, and let through the other, worked with a nut. Theſe compaſſes are made of hardened ſteel.

Triſecting Compasses conſiſt of two central rules, and an arch of circles of 120 degrees, immoveable, with its radius, which is faſtened with one of the central rules like the two legs of a ſector, that the central rule may be carried through all the points of the circumference or the arch. The radius and rule ſhould be as thin as poſſible ; and the rule faſtened to the radius ſhould be hammered cold, to attain the greater elaſticity ; and the breadth of the central rule ſhould be triple that of the radius ; there muſt alſo be a groove in this rule, with a dove-tail faſtened on it for its motion, and a hole in the centre of each rule. The uſe of this inſtrument is to facilitate the triſection of angles geometrically ; and it is ſaid to have been invented by M. Targen for that purpoſe.

Turn-up Compasses. The body of this inſtrument is like the common compaſſes ; but towards the bottom of the legs, without-ſide, are added two other points beſides the uſual ones ; the one whereof carries a drawing pen point, and the other a port-crayon, both adjuſted ſo as to turn round, and be in the way of uſe, or out of it, as occaſion requires. Theſe compaſſes have been contrived to ſave the trouble of changing the points.

COMPASSION, or Commiseration, in *Ethics*, a mixed paſſion compounded of love and ſorrow, and excited by the ſight or recital of diſtreſs. Hobbes makes this a merely ſelfiſh paſſion, and defines it, as being fear for ourſelves ; Hutcheſon reſolves it into inſtinct ; but Dr Butler much more properly conſiders compaſſion as an original, diſtinct, particular affection in human nature.

COMPATIBLE, ſomething that may ſuit or conſiſt with another. See Incompatible.

COMPEIGNE, a handſome town of France, in the department of Oiſe, with a palace, or caſtle, where the king often reſided. The maid of Orleans was taken priſoner here in 1430. It is ſeated on the river Oiſe, near a large foreſt. E. Long. 2. 55. N. Lat. 49. 25. It ſtands about 45 miles north-eaſt of Paris.

COMPENDIUM, in matters of literature, denotes much the ſame as epitome or abridgment. See Abridgment.

COMPENSATION, in a general ſenſe, an action whereby any thing is admitted as an equivalent to another.

Compensation, in *Law*. When the ſame perſon is debtor and creditor to another, the mutual obligations, if they are for equal ſums, are extinguiſhed by compenſation ; if for unequal, the leſſer obligation is extinguiſhed, and the greater diminiſhed, as far as the concourſe of debt and credit goes.

COMPETENCE, or Competency, in a general ſenſe, ſuch a quantity of any thing as is ſufficient.

Competency, in *Law*, the right or authority of a judge, whereby he takes cognizance of any thing.

COMPETENTES, an order of catechumens, in the primitive Chriſtian church, being the immediate candidates for baptiſm. See Catechumen.

COMPETITION, in a general ſenſe, is the ſame with rivalſhip, or when two or more perſons contend for the ſame thing.

Competition, in *Scots Law*. In eſcheats, ſee Law, Part III. N° clxvi. 17, &c. In confirmations by the ſuperior, in reſignations, and in perſonal rights of lands, *ibid.* clxviii. 5—9. In inhibitions, in adjudication, amongſt aſſignees, arreſters, and poinders, *ibid.* clxxi. 6. clxxii. 3. clxxvii. 2. clxxviii. 8, 9, 10. Amongſt creditors of a defunct, clxxxi. 19.

COMPITALIA, or Compitalita, feaſts held among the ancients in honour of the *lares*. The word comes from the Latin *compitum*, a croſs-way ; becauſe the feaſt was held in the meeting of ſeveral roads. The *compitalia* are more ancient than the building of Rome. Dionyſius Halicarnaſſeus, and Pliny, indeed ſay, they were inſtituted by Servius Tullius ; but this only ſignifies that they were then introduced into Rome. The feaſt being moveable, the day whereon it was to be obſerved was proclaimed every year. It was ordinarily held on the 4th of the nones of February, i. e. on the 2d of that month. Macrobius obſerves, that they were held not only in honour of the *lares*, but alſo of *mania*, madneſs. The prieſts who officiated at them were ſlaves and liberti, and the ſacrifice a ſow. They were re-eſtabliſhed, after a long neglect, by Tarquin the Proud, on occaſion of an anſwer of the oracle, *that they ſhould ſacrifice heads for heads* ; i. e. that for the health and proſperity of each family, children were to be ſacrificed : but Brutus, after expelling the kings, in lieu of thoſe barbarous victims ſubſtituted the heads of garlic and poppy ; thus ſatisfying the oracle which had enjoined *capita*, heads. During the celebration of this feaſt, each family placed at the door of their houſe the ſtatue of the goddeſs *Mania* : they alſo hung up at their doors figures of wool, repreſenting men and women ; accompanying them with ſupplications that the lares and mania would be contented with thoſe figures, and ſpare the people of the houſe.

COMPLEMENT, in *Geometry*, is what remains of the quadrant of a circle, or 90°, after any certain arch has been taken away from it. Thus, if the arch taken away be 40°, its complement is 50 ; becauſe $50+40=90$. The ſine of the complement of an arch is called the *coſine*, and that of the tangent the *cotangent*, &c.

COMPLETUS flos, in *Botany*. A flower is ſaid to be complete, which is provided with both the covers, viz. the calyx or flower-cup, and the petals. The term was invented by Vaillant, and is ſynonymous with *calyculatus flos* in Linnæus. Berkenhout erroneouſly confounds it with the *auctus* and *calyculatus calyx* of the ſame author.

COMPLEX, in a more general ſenſe, a term ſynonymous with compound ; though in ſtrictneſs of ſpeech there is ſome difference.

Complex is properly applied where a thing contains many others, or conſiſts of different parts not really diſtinct from each other, but only imaginarily, or in our conceptions. In this ſenſe the ſoul may be ſaid to be complex, in reſpect of the underſtanding and will, which are two things that our reaſon alone diſtinguiſhes in it.

Complex Term, or *Idea*, is a term compounded of ſeveral ſimple or incomplex ones. This in the propoſition, *A juſt God cannot leave crimes unpuniſhed* ; the ſubject of this propoſition, viz. *a juſt God*, is a complex term, or ſtands for a complex idea compoſed of two ſimple or incomplex ones, viz. *God* and *juſt*.

COMPLEXION, among phyſicians, the temperament, habitude, and natural diſpoſition, of the body; but more often the colour of the face and ſkin.

Few queſtions in philoſophy have engaged the attention of naturaliſts more than the diverſities among the human ſpecies, among which that of colour is the moſt remarkable. The great differences in this reſpect have given occaſion to ſeveral authors to aſſert, that the whole human race have not ſprung from one original; but that as many different ſpecies of men were at firſt created as there are now different colours to be found among them. Under the article America, N° 81—100, we have ſhown that all the arguments which can be brought for ſpecific differences among mankind, whether drawn from a difference of colour, ſtature, or diſpoſition, muſt neceſſarily be inconcluſive. It remains, however, a matter of no ſmall difficulty to account for the remarkable variations of colour that are to be found among different nations. On this ſubject Dr Hunter has publiſhed a theſis, in which he conſiders the matter more accurately than has commonly been done, and determines abſolutely againſt any ſpecific difference among mankind. He introduces his ſubject by obſerving, that when the queſtion has been agitated, whether all the human race conſtituted only one ſpecies or not, much confuſion has ariſen from the ſenſe in which the term *ſpecies* has been adopted. He therefore thinks it neceſſary to ſet out with a definition of the term. He includes under the ſame ſpecies all thoſe animals which produce iſſue capable of propagating others reſembling the original ſtock from whence they ſprung. This definition he illuſtrates by having recourſe to the human ſpecies as an example. And in this ſenſe of the term he concludes, that all of them are to be conſidered as belonging to the ſame ſpecies. And as, in the caſe of plants, one ſpecies comprehends ſeveral varieties depending upon climate, ſoil, culture, and ſimilar accidents; ſo he conſiders the diverſities of the human race to be merely varieties of the ſame ſpecies, produced by natural cauſes. Of the different colours obſervable among mankind, he gives the following view:

Black.	Africans under the line. Inhabitants of New Guinea. Inhabitants of New Holland.
Swarthy.	The Moors in the northern parts of Africa. The Hottentots in the ſouthern parts of it.
Copper coloured.	The Eaſt Indians.
Red coloured.	The Americans.
Brown-coloured.	Tartars. Perſians. Arabs. Africans on the coaſt of the Mediterranean. Chineſe.
Browniſh.	The inhabitants of the ſouthern parts of Europe; as Sicilians, and Spaniards; as well as the Abyſſinians in Africa.
Browniſh.	Turks, and likewiſe the Samoiedes and Laplanders.
White.	Moſt of the European nations; as Swedes, Danes, Engliſh, Germans, Poles, &c. Kabardinſki, Georgians, Inhabitants of the iſlands in the Pacific ocean.

In attempting to inveſtigate the cauſes of theſe differences, our author obſerves, that there can be no diſpute of the ſeat of colour being placed in the ſkin; that it is not even extended over the whole of this, but confined to that part named the cuticle, conſiſting of the epidermis and reticulum; and that it chiefly occupies the latter of theſe. The cuticle is much thicker and harder in black people than in white ones; the reticulum in the latter being a thin mucus, in the former a thick membrane. He concludes that this ſeat of colour in whites is tranſparent, and either totally deprived of veſſels, or only furniſhed with very few; as the yellow colour appearing in jaundice vaniſhes on the cauſe of the diſeaſe being removed; which is not the caſe with ſtains in the cuticle from gunpowder, or ſimilar cauſes. He next points out three cauſes deſtroying the pellucidity of the cuticle, giving it a brown colour, and rendering it thicker. Theſe are, acceſs of air, naſtineſs, and the heat of the ſun. The influence of each of theſe he proves by many examples; and from theſe he is inclined to conſider the laſt as by much the moſt powerful. If, however, it be admitted that theſe cauſes have this effect, he thinks that all the diverſity of colour which is to be obſerved among mankind, may be thus accounted for. He remarks, that all the inhabitants of the torrid zone incline more or leſs to a black colour. When we obſerve the differences which occur among them, we muſt at the ſame time remember, that a black colour is not referred to heat alone, but to the other cauſes alſo: and when we attend to the diverſity of temperature that occurs even in the torrid zone, the exiſtence of a white nation there would by no means deſtroy the argument. He is farther of opinion, that the exiſtence of a brown colour, and of conſiderable varieties from white, in the northern and coldeſt parts of Europe, may very eaſily be explained. This he accounts for from the manner of life of the inhabitants, by which they are either expoſed to the inclemency of the air, or to conſtant naſtineſs from ſmoky houſes.

Having thus attempted to account, from natural cauſes, for the varieties which occur among mankind with reſpect to colour, our author obſerves, that, to all this reaſoning, an objection will naturally be made, from conſidering that infants bring theſe marks into the world along with them, before they can be expoſed to any ſuch cauſes. Dr Hunter imagines, however, that this may readily be explained upon the ſuppoſition that many peculiarities acquired by parents are tranſmitted to their poſterity; and of this, he thinks, no one can entertain the leaſt doubt who attends to hereditary diſeaſes. Thus, gout, ſcrophula, mania, and many other affections, although at firſt induced by particular accidents, will continue to affect families for many generations. In the ſame manner a parent expoſed to cauſes deſtroying the natural whiteneſs of his complexion, will beget ſwarthy children ; and the ſame cauſes continuing to operate upon the ſon, the blackneſs will be increaſed. Thus all the different ſhades may have been at firſt induced, and afterwards continued.

The objection here obviated, however, might have been ſhortly anſwered by denying the fact ; for it is now generally known, that the children of the blackeſt negroes are abſolutely *born white*, as will be afterwards noticed.

This ſubject of complexion has been very well illuſtreated by Mr Clarkſon, in a diſſertation introduced in his Eſſay on the commerce and ſlavery of the human ſpecies. The firſt point that occurs to be aſcertained, is "What part of the ſkin is the ſeat of colour ?" The old anatomiſts uſually divide the ſkin into two parts or laminæ ; the exterior and thinneſt, called by the Greeks *epidermis*, by the Romans *cuticula*, and hence by us *cuticule* ; and the interior, called by the former *derma*, and by the latter *cutis*, or *true ſkin*. Hence they muſt neceſſarily have ſuppoſed, that, as the true ſkin was in every reſpect the ſame in all human ſubjects, however various their external hue, ſo the ſeat of colour muſt have exiſted in the cuticle or upper ſurface.

Malpighi, an eminent Italian phyſician of the laſt century, was the firſt perſon who diſcovered that the ſkin was divided into three laminæ or parts ; the cuticle, the true ſkin, and a certain coagulated ſubſtance ſituated between both, which he diſtinguiſhed by the title of *rete mucoſum* ; which coagulated ſubſtance adhered ſo firmly to the cuticle, as, in all former anatomical preparations, to have come off with it ; and, from this circumſtance, to have led the ancient anatomiſts to believe, that there were but two laminæ, or diviſible portions in the human ſkin. See ANATOMY *Index*.

This diſcovery was ſufficient to aſcertain the point in queſtion ; for it appeared afterwards that the cuticle, when divided according to this diſcovery from the other lamina, was ſemitranſparent ; that the cuticle of the blackeſt negro was of the ſame tranſparency and colour as that of the pureſt white ; and hence the true ſkins of both being invariably the ſame, that the rete mucoſum was the ſeat of colour.

This has been farther confirmed by all ſubſequent anatomical experiments ; by which it appears, that, whatever is the colour of this intermediate coagulated ſubſtance, nearly the ſame is the apparent colour of the upper ſurface of the ſkin. Neither can it be otherwiſe ; for the cuticle, from its tranſparency, muſt neceſſarily tranſmit the colour of the ſubſtance beneath it, in the ſame manner, though not in the ſame degree, as the cornea tranſmits the colour of the iris of the eye. This tranſparency is a matter of ocular demonſtration in white people. It is conſpicuous in every bluſh ; for no one can imagine that the cuticle becomes red as often as this happens : nor is it leſs diſcoverable in the veins, which are ſo eaſy to be diſcerned ; for no one can ſuppoſe that the blue ſtreaks, which he conſtantly ſees in the faireſt complexions, are painted, as it were, on the ſurface of the upper ſkin. From theſe, and a variety of other obſervations, no maxim is more true in phyſiology, than that on the rete mucoſum depends the colour of the human body ; or, in other words, that the rete mucoſum being of a different colour in different inhabitants of the globe, and appearing through the cuticle or upper ſurface of the ſkin, gives them that various appearance which ſtrikes us ſo forcibly in contemplating the human race.

As this can be incontrovertibly aſcertained, it is evident, that whatever cauſes co-operate in producing this different appearance, they produce it by acting upon the rete mucoſum ; which, from the almoſt incredible manner in which the cuticle is perforated, is as acceſſible as the cuticle itſelf. Theſe cauſes are probably thoſe various qualities of things, which, combined with the influence of the ſun, contribute to form what we call *climate*. For when any perſon conſiders, that the mucous ſubſtance before mentioned is found to vary in its colour, as the climates vary from the equator to the poles, his mind muſt be inſtantly ſtruck with the hypotheſis, and he muſt adopt it without any heſitation, as the genuine cauſe of the phenomenon.

This fact, of the variation of the mucous ſubſtance, according to the ſituation of the place, has been clearly aſcertained in the numerous anatomical experiments that have been made ; in which ſubjects of all nations have come under conſideration. The natives of many of the kingdoms and iſles of Aſia are found to have their rete mucoſum black : thoſe of Africa, ſituated near the line, of the ſame colour ; thoſe of the maritime parts of the ſame continent, of a duſky brown, nearly approaching to it ; and the colour becomes lighter or darker in proportion as the diſtance from the equator is either greater or leſs. The Europeans are the faireſt inhabitants of the world. Thoſe ſituated in the moſt ſouthern regions of Europe, have in their rete mucoſum a tinge of the dark hue of their African neighbours : hence the epidemic complexion prevalent among them, is nearly of the colour of the pickled Spaniſh olive ; while in this country, and thoſe ſituated nearer the north pole, it appears to be nearly, if not abſolutely, white.

Theſe are facts which anatomy has eſtabliſhed ; and we acknowledge them to be ſuch, that we cannot diveſt ourſelves of the idea, that climate has a conſiderable ſhare in producing a difference of colour.

The only objection of any conſequence that has ever been made to the hypotheſis of climate, is this, that people under the ſame parallels are not exactly of the ſame colour. But this is no objection in fact ; for it does not follow that thoſe countries which are at an equal diſtance from the equator, ſhould have their climates the ſame. Indeed nothing is more contrary to experience than this. Climate depends upon a variety of accidents. High mountains in the neighbourhood of a place make it cooler, by chilling the air that is carried over them by the winds. Large ſpreading ſucculent plants, if among the productions of the ſoil, have the ſame effect ; they afford agreeable cooling ſhades, and a moiſt atmoſphere from their continual exhalations, by which the ardour of the ſun is conſiderably abated. While the ſoil, on the other hand, if of a ſandy nature, retains the heat in an uncommon degree, and makes the ſummers conſiderably hotter than thoſe which are found to exiſt in the ſame latitude where the ſoil is different. To this proximity of what may be termed *burning ſands*, and to the ſulphureous and metallic particles which are continually exhaling from the bowels of the earth, is aſcribed the different degree of blackneſs by which ſome African nations are diſtinguiſhed from each other, though under the ſame parallels. To theſe obſervations we may add, that though the inhabitants of the ſame parallel are not exactly of the ſame hue, yet they differ only by ſhades of the ſame colour; or to ſpeak with more preciſion, that there are no two people, in ſuch a ſituation, one of whom is white and the other black. To ſum up the whole——Suppoſe we were to take a common globe; to begin at the equator; to paint every country along the meridian line in ſucceſſion from thence to the poles; and to paint them with the ſame colour which prevails in the reſpective inhabitants of each, we ſhould ſee the black, with which we had been obliged to begin, inſenſibly changing to an olive, and the olive, through as many intermediate colours, to a white; and if, on the other hand, we ſhould complete any one of the parallels according to the ſame plan, we ſhould ſee a difference perhaps in the appearance of ſome of the countries through which it ran, though the difference would conſiſt wholly in ſhades of the ſame colour.

The argument, therefore, which is brought againſt the hypotheſis, is ſo far from being an objection, that it may be conſidered as one of the firſt arguments in its favour; for if climate has really an influence on the mucous ſubſtance of the body, it is evident, that we muſt not only expect to ſee a gradation of colour in the inhabitants from the equator to the poles, but alſo different ſhades of the ſame colour in the inhabitants of the ſame parallel.

To this argument may be added one that is incontrovertible, which is, that when the black inhabitants of Africa are tranſplanted to colder, or the white inhabitants of Europe to hotter climates, their children, born there, are of a different colour from themſelves; that is, lighter in the firſt, and darker in the ſecond inſtance.

As a proof of the firſt, we ſhall give the words of the Abbé Raynal, in his admired publication. "The children," ſays he, "which they (the Africans) procreate in America, are not ſo black as their parents were. After each generation the difference becomes more palpable. It is poſſible, that after a numerous ſucceſſion of generations, the men come from Africa would not be diſtinguiſhed from thoſe of the country into which they may have been tranſplanted."

This circumſtance we have had the pleaſure of hearing confirmed by a variety of perſons who have been witneſſes of the fact; but particularly by many intelligent Africans, who have been parents themſelves in America, and who have declared, that the difference is ſo palpable in the northern provinces, that not only they themſelves have conſtantly obſerved it, but that they have heard it obſerved by others.

Neither is this variation in the children from the colour of the parents improbable. The children of the blackeſt Africans are born white. In this ſtate they continue for about a month, when they change to a pale yellow. In proceſs of time they become brown. Their ſkin ſtill continues to increaſe in darkneſs with their age, till it becomes of a dirty ſallow black; and at length, after a certain period of years, gloſſy and ſhining. Now, if climate has any influence on the mucous ſubſtance of the body, this variation in the children from the colour of their parents is an event which muſt be reaſonably expected; for being born white, and not having equally powerful cauſes to act upon them in colder, as their parents had in the hotter climates which they left, it muſt neceſſarily follow, that the ſame effect cannot poſſibly be produced.

Hence alſo, if the hypotheſis be admitted, may be deduced the reaſon why even thoſe children who have been brought from their country at an early age into colder regions, have been obſerved to be of a lighter colour than thoſe who have remained at home till they arrived at a ſtate of manhood. For having undergone ſome of the changes which we mentioned to have attended their countrymen from infancy to a certain age, and having been taken away before the reſt could be completed, theſe farther changes, which would have taken place had they remained at home, ſeem either to have been checked in their progreſs, or weakened in their degree, by a colder climate.

We come now to the ſecond and oppoſite caſe; for a proof of which we ſhall appeal to the words of Dr Mitchell in the Philoſophical Tranſactions, N° 476. ſect. 4. "The Spaniards who have inhabited America under the torrid zone for any time, are become as dark coloured as our native Indians of Virginia, of which I myſelf have been a witneſs; and were they not to intermarry with the Europeans, but lead the ſame rude and barbarous lives with the Indians, it is very probable, that, in a ſucceſſion of many generations, they would become as dark in complexion."

To this inſtance we ſhall add one, which is mentioned by a late writer, who, deſcribing the African coaſt and the European ſettlements there, has the following paſſage. "There are ſeveral other ſmall Portugueſe ſettlements, and one of ſome note at Mitomba, a river in Sierra Leone. The people here called *Portugueſe* are principally perſons bred from a mixture of the firſt Portugueſe diſcoverers with the natives, and now become, in their complexion and woolly quality of their hair, perfect negroes, retaining, however, a ſmattering of the Portugueſe language."

Theſe facts with reſpect to the coloniſts of the Europeans are of the higheſt importance in the preſent caſe, and deſerve a ſerious attention. For when we know to a certainty from whom they are deſcended; when we know that they were, at the time of their tranſplantation, of the ſame colour as thoſe from whom they ſeverally ſprung; and when, on the other hand, we are credibly informed that they have changed it for the native colour of the place which they now inhabit: the evidence in ſupport of theſe facts is as great as if a perſon, on the removal of two or three families into another climate, had determined to aſcertain the circumſtance; as if he had gone with them and watched their children; as if he had communicated his obſervations at his death to a ſucceſſor; as if his ſucceſſor had proſecuted the plan; and thus an uninterrupted chain of evidence had been kept up from their firſt removal to any determined period of ſucceeding time.

But though theſe facts ſeem ſufficient of themſelves to confirm our opinion, they are not the only facts which can be adduced in its ſupport. It can be ſhown, that the members of the very ſame family, when divided from each other, and removed into different countries, have not only changed their family complexion, but that they have changed it to as many different colours as they have gone into different regions of the world. We cannot have, perhaps, a more ſtriking inſtance of this than in the Jews. Theſe people are ſcattered over the face of the whole earth. They have preſerved themſelves diſtinct from the reſt of the world by their religion; and as they never intermarry with any but thoſe of their own ſect, ſo they have no mixture of blood in their veins that they ſhould differ from each other; and yet nothing is more true, than that the Engliſh Jew is white, the Portugueſe ſwarthy, the Armenian olive, and the Arabian copper; in ſhort, that there appear to be as many different ſpecies of Jews as there are countries in which they reſide.

To theſe facts we ſhall add the following obſervation, that if we can give credit to the ancient hiſtorians in general, a change from the darkeſt black to the pureſt white muſt have actually been accompliſhed. One inſtance, perhaps, may be thought ſufficient. Herodotus relates, that the Colchi were black, and that they had criſped hair. Theſe people were a detachment of the Æthiopian army under Seſoſtris, who followed him in his expedition, and ſettled in that part of the world where Colchis is uſually repreſented to have been ſituated. Had not the ſame author informed us of this circumſtance, we ſhould have thought it ſtrange that a people of this deſcription ſhould have been found in ſuch a latitude. Now, as they were undoubtedly ſettled there, and as they were neither ſo totally deſtroyed, nor made any ſuch rapid conqueſts, as that hiſtory ſhould notice the event, there is great reaſon to preſume that their deſcendants continued in the ſame, or ſettled in the adjacent, country; from whence it will follow, that they muſt have changed their complexion to that which is obſerved in the inhabitants of this particular region at the preſent day; or, in other words, that the black inhabitants of Colchis muſt have been changed into the fair Circaſſian. Suppoſe, without the knowledge of any hiſtorian, they had made ſuch conſiderable conqueſts as to have ſettled themſelves at the diſtance of 1000 miles in any one direction from Colchis, ſtill they muſt have changed their colour: For had they gone in an eaſtern or weſtern direction, they muſt have been of the ſame colour as the Circaſſians; if to the north, whiter; if to the ſouth, of a copper colour. There are no people within that diſtance of Colchis who are black.

From the whole of the preceding obſervations on the ſubject, we may conclude, that as all the inhabitants of the earth cannot be otherwiſe than the children of the ſame parents, and as the difference of their appearance muſt have of courſe proceeded from incidental cauſes, theſe cauſes are a combination of thoſe qualities which we call *climate*: that the blackneſs of the Africans is ſo far engrafted in their conſtitution, in a courſe of many generations, that their children wholly inherit it, if brought up in the ſame ſpot; but that it is not ſo wholly interwoven in their nature, that it cannot be removed if they are born and ſettled in another.

The ſame principles with the above we find adopted and further illuſtrated by Profeſſor Zimmerman of Brunſwick, in his celebrated work The Geographical Hiſtory of Man, &c. He there proves in the moſt ſatisfactory manner, That the complexion of the human ſpecies is uniformly correſpondent with the degree of heat or cold to which they are habitually expoſed. In maintaining this poſition, he makes a very proper diſtinction with regard to climate. By *climates* we are to underſtand, not ſimply or ſolely thoſe diſtinguiſhed by the geographical diviſions of the globe, to the excluſion of what he terms *phyſical* climate, or that which depends on the changes produced in any given latitude by ſuch adventitious circumſtances as the lower or more elevated ſituations of a country, its being encompaſſed by water or large tracts of land, overſpread or ſurrounded with foreſts, placed in an extenſive plain, or environed by lofty mountains. Peculiarities of the like kind, as has been already noticed, frequently prevent the *phyſical* climate from correſponding entirely with the *geographical*, as a country influenced by them is often much warmer or colder than other regions placed under the ſame degree of latitude. The influence of theſe ſecondary or modifying circumſtances has been already adverted to, and need not be further enlarged upon: we ſhall here only obſerve, that the erroneous reaſoning of Lord Kames on this ſubject ſeems to have been owing to this inattention to the difference above mentioned. At Senegal, and in the adjacent lands, the thermometer is often at 112 or 117 degrees in the ſhade; and here we find the inhabitants jet black, with woolly hair. The heat is equally great in Congo and Loango, and theſe countries are inhabited by negroes only; whereas in Morocco, to the north of theſe regions, and at the Cape of Good Hope, to the ſouth, the heat is not ſo intenſe, nor are the inhabitants of ſo deep a hue. Lord Kames aſks, Wherefore are not the Abyſſinians and the inhabitants of Zaara of as dark a complexion as the Moors on the coaſt of Guinea? M. Zimmerman anſwers, that "theſe countries are much cooler. The deſert is not only farther from the equator, but the winds blowing over the Atlas mountains, which like the Alps are covered with ſnow, and the weſterly wind coming from the ſea, muſt conſiderably mitigate the heat. Nor is Abyſſinia ſo warm as either Monomotapa or Guinea. The north-eaſt winds from the ſide of Perſia and Arabia are cooled by their paſſage over the Red Sea: the northern winds from Egypt loſe much of their heat on the chain of mountains that is extended between the countries; the winds from the ſouth and the weſt are ſea-winds. Thus, the only quarter from which they can derive exceſſive heat is from the weſt, as the air on this ſide muſt paſs over tracts of heated lands." For a ſimilar reaſon it is that negroes are not found either in Aſia or South America under the equator. The ſituations of theſe countries, our author obſerves, expoſe them to ſea-breezes and cooling winds from the continent. He confirms this hypotheſis by obſerving, that the mountaineers of warm climates, as in Barbary and Ceylon, are much fairer than the inhabitants of the valleys:

that the Saracens and Moors who conquered the north-eaſt part of Africa in 1700, from being brown, are become like the negroes near the equator: that the Portugueſe, who ſettled at Senegal in 1400, became blacks; and Tudela the Jew aſſerts, that his countrymen in Abyſſinia acquired the dark complexion of the original natives.

Upon the whole, colour and figure may be ſtyled habits of the body. Like other habits, they are created, not by great and ſudden impreſſions, but by continual and almoſt imperceptible touches. Of habits both of mind and body, nations are ſuſceptible as well as individuals. They are tranſmitted to offſpring, and augmented by inheritance. Long in growing to maturity, national features, like national manners, become fixed only after a ſucceſſion of ages. They become, however, fixed at laſt; and if we can aſcertain any effect produced by a given ſtate of weather or of climate, it requires only repetition during a ſufficient length of time to augment and impreſs it with a permanent character. The ſanguine countenance will, for this reaſon, be perpetual in the higheſt latitudes of the temperate zone; and we ſhall for ever find the ſwarthy, the olive, and tawny, and the black, as we deſcend to the ſouth.

The uniformity of the effect in the ſame climate, and on men in a ſimilar ſtate of ſociety, proves the power and certainty of the cauſe. If the advocates of different human ſpecies ſuppoſe that the beneficent Deity hath created the inhabitants of the earth of different colours, becauſe theſe colours are beſt adapted to their reſpective zones; it ſurely places his benevolence in a more advantageous light to ſay, he has given to human nature the power of accommodating itſelf to every zone. This pliancy of nature is favourable to the union of the moſt diſtant nations, and facilitates the acquiſition and the extenſion of ſcience, which would otherwiſe be confined to few objects and to a very limited range. It opens the way particularly to the knowledge of the globe which we inhabit; a ſubject ſo important and intereſting to man. It is verified by experience. Mankind are for ever changing their habitations by conqueſts or by commerce; and we find them in all climates, not only able to endure the change, but ſo aſſimilated by time, that we cannot ſay with certainty whoſe anceſtor was the native of the clime, and whoſe the intruding foreigner.

All the foregoing obſervations have been well recapitulated, illuſtrated by new facts, and enforced by additional reaſoning founded on experience, by the Reverend Dr S. S. Smith, profeſſor of moral philoſophy in the college of New Jerſey, in his *Eſſay on the Cauſes of the variety of Complexion and Figure in the Human ſpecies*; to which the reader who wiſhes for further ſatisfaction on the ſubject is referred.

COMPLEXUS; and *Complexus Minor*, or *Trabelo-maſtoidæus*; two muſcles in the poſterior part of the trunk. See Anatomy, *Table of the Muſcles*.

COMPLICATION, in general, denotes the blending, or rather interweaving, of ſeveral different things together: thus, a perſon afflicted with ſeveral diſorders at the ſame time, is ſaid to labour under a complication of diſorders.

COMPLINE, the laſt diviſion of the Romiſh breviary. It was inſtituted to implore God's protection during the night, as the *prime* is for the day. It is recited after ſunſet; and is ſo called, becauſe it completes the office for the 24 hours.

COMPLUTENSIAN bible. See Bible (*Greek*.)

COMPONE, or Componed, or *Gobony*, in *Heraldry*. A bordure compone is that formed or compoſed of a row of angular parts, or chequers of two colours.

COMPONED, or Composed, is alſo uſed in general for a bordure, a pale, or a feſs, compoſed of two different colours or metals diſpoſed alternately, ſeparated and divided by fillets, excepting at the corners; where the junctures are made in form of a goat's foot.

COMPOSITE, in general, denotes ſomething compounded, or made up of ſeveral others united together; thus,

Composite Numbers, are ſuch as can be meaſured exactly by a number exceeding unity; as 6 by 2 or 3, or 10 by 5, &c. ſo that 4 is the loweſt compoſite number. Compoſite numbers, between themſelves, are thoſe which have ſome common meaſure beſides unity; as 12 and 15, as being both meaſured by 3.

Composite Order, in *Architecture*, the laſt of the five orders of columns; ſo called becauſe its capital is compoſed out of thoſe of the other columns, borrowing a quarter round from the Tuſcan and Doric, a row of leaves from the Corinthian, and volutes from the Ionic. Its corniche has ſimple modillions, or dentils. It is alſo called the *Roman* or *Italic* order, as having been invented by the Romans. By moſt authors it is ranked after the Corinthian, either as being the next richeſt, or the laſt invented. See Architecture, N° 48.

COMPOSITION, in a general ſenſe, the uniting or putting together ſeveral things, ſo as to form one whole, called a *compound*.

Composition of Ideas, an act of the mind, whereby it unites ſeveral ſimple ideas into one conception or complex idea.

When we are provided with a ſufficient ſtock of ſimple ideas, and have by habit and uſe rendered them familiar to our minds, they become the component parts of other ideas ſtill more complicated, and form what we may call a ſecond order of compound notions. This proceſs may be continued to any degree of compoſition we pleaſe, mounting from one ſtage to another, and enlarging the number of combinations.

Composition, in *Grammar*, the joining of two words together; or prefixing a particle to another word, to augment, diminiſh, or change its ſignification.

Composition, in *Logic*, a method of reaſoning whereby we proceed from ſome general ſelf-evident truth to other particular and ſingular ones.

In diſpoſing and putting together our thoughts, there are two ways of proceeding equally within our choice; for we may ſo ſuppoſe the truths, relating to any part of knowledge, as they preſented themſelves to the mind in the manner of inveſtigation: carrying on the ſeries of proofs in a reverſe order, till they at laſt terminate in firſt principles: or beginning with theſe principles, we may take the contrary way; and from them deduce, by a direct train of reaſoning, all the ſeveral propoſitions we want to eſtabliſh.

This diverſity in the manner of arranging our thoughts gives riſe to the twofold diviſion of method eſtabliſhed among logicians; the one called *analytic* method, or the method of *reſolution*, inaſmuch as it traces things back to their ſource, and reſolves knowledge into its firſt and original principles. This method ſtands in contradiſtinction to the method of compoſition; or, as it is otherwiſe called, the *ſynthetic* method; for here we proceed by gathering together the ſeveral ſcattered parts of knowledge, and combining them into one ſyſtem, in ſuch a manner as that the underſtanding is enabled diſtinctly to follow truth through all the different ſtages of gradation.

COMPOSITION, in *Muſic*, is the art of inventing and writing airs; of accompanying them with a ſuitable harmony; in ſhort, of forming a complete piece of muſic in all its parts.

The knowledge of melody, harmony, and its rules, is the foundation of compoſition. Without doubt, it is neceſſary to know in what manner chords ſhould be filled, how to prepare and reſolve diſſonances, how to find the fundamental baſs, and how to put in practice all the other minutiæ of elementary knowledge; but with the mechanical rules of harmony alone, one is by no means better qualified to underſtand the art, and operate in the practice of compoſition, than to form himſelf for eloquence upon all the rhetorical precepts exhibited in grammar. We need not ſay, that beſides this, it is neceſſary to underſtand the genius and compaſs of voices and inſtruments; to judge what airs may be of eaſy, and what of difficult, execution; to obſerve what will, and what will not, be productive of any effect; to feel the character of different movements, as well as that of different modulations, that both may be always ſuitably applied; to know the different rules eſtabliſhed by convention, by taſte, by caprice, or by pedantry, as fugues, imitations, or in pieces where the ſubject is confined to uniform laws in its harmony, melody, rythmus, &c. All theſe acquiſitions are ſtill no more than preparatives for compoſition: but the compoſer muſt find in his own genius the ſources of beautiful melody, of ſublime harmony, the pictureſque, and the expreſſive in muſic; he muſt, in ſhort, be capable of perceiving, and of forming, the order of the whole piece; to follow the relations and aptitudes of which it is ſuſceptible in every kind; to inflame his ſoul with the ſpirit and enthuſiaſm of the poet, rather than childiſhly amuſe himſelf with punning in harmony, or adapting the muſic to each particular word. It is with reaſon that our muſicians have given the name of *words* to the poems which they ſet to muſic. It appears evident from their manner of expreſſing them, that, in their apprehenſion, they ſeemed words, and words alone. One would be tempted to imagine, particularly during ſome of theſe laſt years, that the rules for the formation and ſucceſſion of chords have cauſed all the reſt to be neglected or forgotten; and that harmony has made no acquiſitions but at the expence of what is general and eſſential in the muſical art. All our artiſts know how to fill a chord with its conſtituent ſounds, or a piece of harmony with its conſtituent parts; but not a ſoul amongſt them feels a ray of compoſition. As to what remains, though the fundamental rules of counterpoint, or muſic in parts, continues ſtill the ſame, they are more or leſs rigorous and inflexible in proportion as the parts increaſe in number; for according as the parts are multiplied, the difficulty of compoſition is heightened, and the rules are leſs ſevere. Compoſitions in two parts are called *duettos* when the two performers ſing equally; that is to ſay, when the ſubject is no further extended, but divided between them: but if the ſubject is in one part alone, and the ſubordinate harmony no more than an accompanyment, the firſt part is then either called a *recitative* or a *ſolo*; and the other an *accompanyment*, or *continued baſs*, if it is a baſs. It is the ſame caſe with the *trio*, with compoſitions in three, in four, or in five parts.

The name of *compoſition* is likewiſe given to ſuch pieces of muſic themſelves as are formed according to the rules of the art. For this reaſon the *duetts*, *trios*, *quartettos*, which have juſt been mentioned, are called *compoſitions*.

Compoſitions are either formed for the voice alone, or for inſtruments, or for voices and inſtruments joined. Full choruſes and ſongs are the only compoſitions principally intended for the voice, though ſometimes inſtruments are joined with it to ſupport it. Compoſitions for inſtruments are intended to be executed by a band in the orcheſtra, and then they are called *ſymphonies*, *concertos*; or for ſome particular ſpecies of inſtruments, and then they are called *pieces* or *ſonatas*.

Such compoſitions as are deſtined both for voices and inſtruments, have been generally divided into two capital ſpecies, viz. the *ſacred* and the *ſecular*. The compoſitions deſtined for the church, whether pſalms, hymns, anthems, or reſponſives, are in general diſtinguiſhed by the name of *church-muſic*, and characterized by their intention to be ſung with words. Secular muſic in general may likewiſe be divided into two kinds; *theatrical* and *chamber* muſic. Of the firſt kind is that uſed in the operas; the ſubdiviſions of the ſecond are endleſs. Solos, concertos, cantatas, ſongs, and airs, almoſt of every kind, which are not adapted to the church or the ſtage, may be included in the idea of *chamber-muſic*.

In general, it is thought, that ſacred muſic requires deeper ſcience, and a more accurate obſervation of rules; the ſecular ſpecies gives more indulgence to genius and ſubſiſts in greater variety.

But we muſt here obſerve, that the eccleſiaſtical muſic now uſed, or rather profaned and murdered, amongſt us, though regular in its harmony, is ſimple in its compoſition, and demands not that profound knowledge in the art, either to form or comprehend it, which Rouſſeau, whom till now we have followed in this article, ſeems to imagine. His aſſertion can only be applicable to the church muſic of Italy. That which is now eſtabliſhed amongſt us ſeems not to be indigenous, but transferred with the Calviniſtical liturgy from Geneva; and as it is intended for popular uſe, it can by no means be eſteemed a high exertion of the muſical art; yet, however ſimple, it is pleaſing; and, when properly performed, might elevate the ſoul to a degree of devotion, and even of rapture, which at preſent we are ſo far from feeling, that we rather ſeem to ſleep or to howl, than to ſing the praiſe of God. Perhaps our clergy may find more advantage in cultivating their farms; but they would ſurely feel a higher and diviner pleaſure in cultivating the taſtes and voices,

voices of their people. The one, however, is not incompatible with the other. An hour of relaxation in a winter evening might ſerve for the accompliſhment of this pious purpoſe; and one ſhould imagine, that, independent of religious conſiderations, the ſpirit of the craft might dictate ſuch a meaſure as calculated to produce popular entertainment and gain popular affection.

In compoſition, the author either confines himſelf, as a ſubject, to the mere mechanical modulations and arrangements of ſound; and, as his end, to the pleaſure of the ear alone; or otherwiſe he ſoars a nobler height; he aſpires to imitative muſic; he endeavours to render the hearts and ſouls of his auditors ductile by his art, and thus to produce the nobleſt emotions and moſt ſalutary effects. In the firſt view, it is only neceſſary that he ſhould look for beautiful ſounds and agreeable chords; but in the ſecond he ought to conſider muſic in its conformity with the accents of the human voice, and in the expreſſive powers of notes harmonically combined to ſignify or paint ſuch objects as are ſuſceptible of imitation. In Rouſſeau's article *opera*, ſome ideas may be found by which the art may be ennobled and elevated, by forming muſic into a language more powerful and pathetic than eloquence itſelf. See OPERA.

COMPOSITION, in literature, the art of forming and arranging ſentiments, and clothing them with language ſuitable to the nature of the ſubject or diſcourſe. See the articles LANGUAGE, ORATORY, POETRY, DIALOGUE, EPISTLE, and HISTORY.

COMPOSITION, in *Chemiſtry*, is the union and combination of ſeveral ſubſtances of different natures, from which a compound body reſults. From this union of bodies of different natures, a body is formed, of a mixed nature, which Becker and Stahl have called a *mixture*, and which may be called a *combination*, or *chemical compoſition*, to avoid the equivocal ſenſe of the word *mixture*. By this laſt, we underſtand only a mere appoſition of parts; and which would therefore give a very falſe idea of chemical compoſition, in which a mutual adheſion takes place between the combined ſubſtances.

COMPOSITION, in *Painting*, includes the invention as well as diſpoſition of the figures, the choice of attitudes, &c.

Compoſition, therefore, conſiſts of two parts; one of which finds out, by means of hiſtory, proper objects for a picture; and the other diſpoſes them to advantage. See PAINTING.

COMPOSITION, in *Pharmacy*, the art or act of mixing divers ingredients together into a medicine, ſo as they may aſſiſt each other's virtues, ſupply each other's defects, or correct any ill qualities thereof. See PHARMACY.

COMPOSITION, in *Commerce*, a contract between an inſolvent debtor and his creditors, whereby the latter accept of a part of the debt in compoſition for the whole, and give a general acquittance accordingly.

COMPOSITION, in *Printing*, commonly termed *compoſing*, the arranging of ſeveral types or letters in the compoſing-ſtick, in order to form a line; and of ſeveral lines ranged in order, in the galley, to make a page; and of ſeveral pages to make a form. See PRINTING.

COMPOSITÆ, in *Botany*. The name of a claſs in Hermannus and Royen; as likewiſe of an order in Linnæus's fragments of a natural method, conſiſting in general of the plants which have the characters enumerated in the following article. A particular deſcription of this order is given under the article SYNGENESIA, which includes all the compound flowers.

COMPOSITUS FLOS, in *Botany*, an aggregate flower, compoſed of many *floſculi ſeſſiles*, on a common entire receptaculum, with a common perianthium, and whoſe antheræ being five in number unite in the form of a cylinder; the floſculi are monopetalous, and under each of them is a monoſpermous germen. Compound flowers are either *ligulati*, *tubuloſi*, or *radiati*.

COMPOST, in *Agriculture*, denotes a certain kind of mixture deſigned to aſſiſt the ſoil in the way of vegetation, inſtead of dung. The requiſites for a compoſt are, 1. That it ought to be cheaper than the quantity of dung required for an equal extent of ſoil. 2. It ought to be leſs bulky; and, 3. It ought to produce equal effects.

Under the article AGRICULTURE we have endeavoured to ſhow, that the true vegetable food conſiſts in reality of the putrid effluvia proceeding from decayed animal and vegetable ſubſtances. If this theory is admitted, the hope of making compoſt as a ſuccedaneum for dung is but very ſmall, unleſs they are made of putrefied animal and vegetable ſubſtances; in which caſe, unleſs in very ſingular circumſtances, they will prove much dearer than dung itſelf. Several attempts, however, have been made by thoſe who had other views concerning the nature of the true vegetable food. An oil compoſt is recommended in the Georgical Eſſays, upon a ſuppoſition that the food of vegetables is of an oily nature. It is made as follows: "Take of North American potaſh 12 lb. Break the ſalt into ſmall pieces, and put it into a convenient veſſel with four gallons of water. Let the mixture ſtand 48 hours: then add coarſe train oil 14 gallons. In a few days the ſalt will be diſſolved, and the mixture, upon ſtirring, will become nearly uniform. Take 14 buſhels of ſand, or 20 of dry mould: upon theſe pour the above liquid ingredients. Turn this compoſition frequently over, and in ſix months it will be fit for uſe. When the liquid ingredients are put to one or two hogſheads of water, a liquid compoſt will be formed, which muſt be uſed with a water cart."

This compoſt, however, the inventor himſelf owns to be inferior to rotten dung, as indeed may very naturally be ſuppoſed; yet in ſome caſes it ſeems capable of doing ſervice, as will appear from ſome of the following experiments which we extract from the eſſays above mentioned.

Exp. I. By the author of the eſſays. "I took four pots, N°. 1, 2, 3, 4. N°. 1. contained 12 lb. of barren ſand, with 1 oz. of the ſand oil-compoſt. N° 2. contained 12 lb. of ſand without any mixture. N° 3. had 12 lb. of ſand with half an ounce of ſlaked lime. N° 4. had 12 lb. of ſand with 4 oz. of the ſand oil-compoſt. In the month of March I put ſix grains of wheat into each pot, and during the ſummer I occaſionally watered the plants with filtrated water. All the time the plants were conſuming the farina, I could obſerve very little difference in their appearence. But after one month's growth, I remarked that N° 1. was the beſt; N° 2. the next; N° 3. the next; and N° 4. much the worſt." The ſame differences were obſerved in Auguſt, when N° 1. the beſt, had five ſmall ears, which contained a few poor grains of wheat.

Exp. II. By the ſame. "In the month of June, I ſelected four lands of equal goodneſs in a field intended for turnips. The ſoil was a light ſand, with a tolerable quantity of vegetable earth amongſt it. It was ploughed out of ſward in November, and had not borne a crop for many years. I ſhall diſtinguiſh my experimental lands by N° 1, 2, 3, 4. N° 1. was manured with rotten dung; N° 2. with oil-compoſt; N° 3. with lime; N° 4. was left without any dreſſing. On the 20th of June they were all ſown with turnip-ſeed broadcaſt, and during the courſe of the ſeaſon were twice hoed. In November I viewed the field, and made the following remarks. N° 1. the beſt; N° 2. the next; N° 3. the worſt; N° 4. better than N° 3." Here the oil-compoſt appears in a favourable light; but other trials, made with equal accuracy, ſeem rather to prove, that it is not proper for turnips, barley, or quick-growing vegetables. It requires being meliorated by the atmoſphere, and therefore is better adapted for winter crops.

Exp. III. By the ſame. "In the month of May, I planted 12 alleys that lay between my aſparagus beds with cauliflower plants. Each alley took up about 30 plants. One of the alleys I ſet apart for an experiment with the oil-compoſt, prepared according to the directions already given. About an handful of the compoſt was put to the root of each cauliflower plant. In all other reſpects the alley was managed like the reſt. The plants in general flowered very well; but thoſe to which I applied the compoſt ſprung up haſtily with ſmall ſtalks, and produced very poor flowers. I imputed this unfavourable appearance to the freſhneſs of the compoſt, which was only a few weeks old. In the September following this unſucceſsful experiment, I planted the ſame alleys with early cabbages. The neceſſity of meliorating the compoſt was in this trial fully confirmed. For the cabbages that grew upon the alley, which in May had received the compoſt, were larger and in all reſpects finer than the others."

Exp. IV. by James Stovin, Eſq. of Doncaſter. "In the year 1769, I made the following trial with the oil-compoſt, prepared as above directed. One acre ſown with barley and manured with oil-compoſt at 18s. produced five quarters five buſhels. An acre adjoining, ſown with barley, and manured with 12 loads of rotten dung at 3l. produced four quarters three buſhels and two pecks. The compoſt barley was bolder and better corn than the other. In the year 1770, the dunged acre produced of rye, three quarters. The compoſt acre of ditto, two quarters ſix buſhels. In the year 1771, the ſame lands were ſown with oats, and the produce was greatly in favour of the dunged acre. Theſe experimental lands were in a common field that had been long under the plough."

Exp. V. by Richard Townley, Eſq; of Belfield. "In the ſpring 1770, I prepared a piece of ground for onions. It was laid out into ſix beds of the ſame ſize, and which were all ſown at the ſame time. Over two of them, the oil-compoſt was ſcattered in a very moderate quantity. Over other two, pigeons dung: and over the remaining two, ſome of my *weed-compoſt* (formed of putrefied vegetables), which I eſteem one of the beſt manures, for moſt vegetables, that can be made. The onions came up very well in all the beds; but in about ſix weeks, thoſe that were fed with the oil-compoſt, plainly diſcovered the advantage they had over the reſt by their luxuriancy and colour, and at the end of the ſummer perfected the fineſt crop I had ever ſeen, being greatly ſuperior to the others both in quantity and ſize. The ſame ſpring I made an experiment upon four rows of cabbages, ſet at the diſtance of four feet every way. Two were manured with oil-compoſt, and two with my own. All the plants were unluckily damaged, juſt before they began to form, by ſome turkeys getting into the field and plucking off the greateſt part of the leaves. However, they ſo far recovered, in the September following, from 22 to 28lb. a-piece. The rows proved ſo equal in goodneſs, that I could not determine which had the advantage. The ſame year, one part of a field of wheat expoſed to the north-eaſt winds, which that ſpring continued to blow for a month or five weeks, appeared very poor and languid at the time of tillering. Over it I ordered ſome of the oil-compoſt to be ſown with the hand; which not only recovered, but alſo puſhed forwards the wheat plants in that part of the field, ſo as to make them little inferior, if any, to the reſt. The ſame ſpring, I made a comparative experiment, upon four contiguous lands of oats, between the oil-compoſt and my own weed-compoſt. The latter had manifeſtly the advantage, though the other produced a very large and fine crop. I alſo tried the oil-compoſt upon carrots, and it anſwered exceedingly well. I did the ſame this year (1771) both upon them and my onions, and have the fineſt crops of theſe vegetables I ever ſaw anywhere upon the ſame compaſs of ground."

Exp. VI. by Mr J. Broadbent of Berwick, in Elmet near Leeds.——"On the firſt of October 1771, I ſowed two acres of a light channelly ſoil with wheat, and harrowed in the compoſt with the grain. Being at a conſiderable diſtance from a large town, we find it very difficult and expenſive to procure rotten dung in ſufficient quantity for our tillage lands, for which reaſon we have recourſe to land-dreſſings both for our winter and ſpring corn. Rape-duſt and ſoot are principally uſed; but the preſent price of both theſe articles is a heavy tax upon the farmer. To obviate that inconvenience, I reſolved to make trial of the oil-compoſt; and from what I have obſerved in this one experiment, I am encouraged to make a more extenſive uſe of it the next year. Being well acquainted with the nature and efficacy of ſoot, I am ſatisfied, that the above two acres produced as good a crop of wheat as if they had been dreſſed with that excellent manure."

On the ſuppoſition that vegetables are ſupported by matters of a ſaline nature, compoſts formed of different ſorts of ſals have been contrived, but with leſs ſucceſs than the one above treated of. A famous compoſition

poſition of this kind was lately ſold by patent, under the name of *Baron Van Haak's Compoſt*. The following experiment is mentioned in the Georgical Eſſays, as made with a view to determine the virtues of it compared with the oil-compoſt and ſoot mixed with aſhes.—" In the beginning of April 1773, an acre of land was ſown with early oats. I pitched upon one land in the middle of the piece, which I eſteemed better than any of the reſt; and upon this I ſcattered Baron Van Haak's compoſt, in the quantity directed in his inſtructions. On one ſide I manured a land with the oil-compoſt, but rather with a leſs quantity than directed; and, on the other ſide, I manured two lands with dry coal-aſhes ſifted fine, and an equal quantity of ſoot. The lands upon which this experiment was made, were much worn out with a long ſucceſſion of crops. The lands which had the benefit of the aſhes and ſoot produced an exceeding fine crop; the oil-compoſt produced a tolerable good one; but that which had only the aſſiſtance of the baron's compoſt, produced a very poor one. It could not have been worſe had it been left deſtitute of every aſſiſtance."

Compoſts, made with putrefied animal ſubſtances will no doubt anſwer much better, in moſt caſes, than any other kind of manure, but they are difficult to be procured. The following is recommended to Dr Hunter of York.—" Take a ſufficient quantity of ſawduſt, incorporate it with the blood and offal of a ſlaughter-houſe, putting a layer of one and a layer of the other till the whole becomes a moiſt and fetid compoſition. Two loads of this compoſt, mixed with three loads of earth, will be ſufficient for an acre of wheat or ſpring-corn. Being a kind of top-dreſſing, it ſhould be put on at the time of ſowing, and harrowed in with the grain. The preſent year I have a field of wheat manured in this manner, and have the pleaſure to ſay, that it is extremely clean, and has all the appearance of turning out an excellent crop. As this kind of compoſt lies in a ſmall compaſs, it ſeems well adapted for the uſe of ſuch farmers as are obliged to bring their manures from a diſtance. It is beſides extremely rich, and will probably continue in the land much longer than fold-yard or ſtable-dung. I apprehend that it is capable of reſtoring worn-out land to its original freſhneſs; and I am induced to be of that opinion, from the appearance of the above crop, which is now growing upon land much impoveriſhed by bad management."

Another compoſt, prepared from whales fleſh, is recommended by Mr Charles Chaloner.—" I have a particular pleaſure (ſays he) in deſcribing and making public the beſt method of forming a compoſt from whales fleſh, as recommended to me by Dr Hunter. Having marked out the length and breadth of your intended dung-hill, make the firſt layer of earth about a foot in thickneſs. Moor-earth, or ſuch as is taken from ant-hills, is the beſt for this purpoſe. Over the earth lay one layer of long litter, from the fold yard or ſtable, above 12 inches in thickneſs, then a layer of whale-fleſh, and over that another layer of dung. Repeat the operations till the heap be raiſed about ſix feet, then give it a thick covering of earth, and coat the heap with ſods. In this manner each layer of fleſh will be placed between two layers of dung. In about a month turn the whole in the uſual manner, which will occaſion a ſtrong degree of heat and fermentation. When turned, coat with earth as before, with a view to confine the putrid ſteam which would otherwiſe eſcape. In a month or two the heap will be found to be conſiderably fallen, when it ſhould have a ſecond turning as before. The operation of turning muſt be repeated at proper intervals, till the whole becomes an uniformly putrid maſs. The whale-fleſh is of different degrees of firmneſs, ſome of it being almoſt liquid; and, in proportion to its firmneſs, the heap will become ſooner or later fit for uſe. In general, the compoſt ſhould not be uſed till 12 months old; but that depends upon circumſtances. Guard the heap from dogs, pigs, badgers, and vermin, as theſe animals are remarkably fond of whale-fleſh. This animal compoſt may with great advantage be applied to all purpoſes where good rotten dung is required. I have uſed it with great ſucceſs for cabbages, and find it an excellent dreſſing for meadow-ground. According to the beſt computation, one hogſhead of whale refuſe, will make eight loads of dung; which when we conſider the great facility with which this baſis of our dung-hill may be carried, is a momentuous concern to ſuch farmers as lie remote from a large town." See Manure.

Compost, in gardening, is a mixture of ſeveral earths, earthy ſubſtances, and dungs, either for the improvement of the general ſoil of a garden, or for that of ſome particular plants. Almoſt every plant delights in ſome peculiar mixture of ſoils or compoſt, in which it will thrive better than in others. The moſt remarkable and generally uſeful of theſe, are taken notice of under the deſcription of the ſeveral botanical articles, as they occur in the order of the alphabet.

COMPOSTELLA, a celebrated town of Spain, and capital of Galicia, with an archbiſhop's ſee, and an univerſity. The public ſquares, and the churches, particularly the metropolitan church, are very magnificent. It has a great number of monaſteries, for both ſexes, and about 2000 houſes. It is pretended that the body of St James was buried here, which draws a great number of pilgrims from moſt parts of Chriſtendom. They walk in proceſſion to the church, and viſit his wooden image, which ſtands on the great altar, and is illuminated with 40 or 50 wax-candles. They kiſs it three times with a very reſpectful devotion, and then put their hats on its head. In the church there are 30 ſilver lamps always lighted, and ſix chandeliers of ſilver, five feet high. The poor pilgrims are received into an hoſpital, built for that purpoſe, which ſtands near the church; and round it are galleries of free-ſtone, ſupported by large pillars. The archbiſhop is one of the richeſt prelates in Spain, having 70,000 crowns a-year. From this town the military order of St Jago, or St James, had its original. It is ſeated in a peninſula, formed by the rivers Tambra and Ulla, in a pleaſant plain, 265 miles north-weſt of Madrid. W. Long. 8. 17. N. Lat. 42. 52.

New Compostella, a town of North America, in New Spain, and province of Xaliſco, built in 1531. It is ſeated near the South ſea. W. Long. 109. 42. N. Lat. 21. 20.

COMPOUND, in a general ſenſe, an appellation given to whatever is compoſed or made up of different things; thus we ſay, a compound word, compound ſound, compound taſte, &c.—*Compound* differs from *complex*, and ſtands oppoſed to *ſimple*. See COMPLEX and SIMPLE.

COMPOUND *Flower*. See *Compoſitus Flos*.

COMPOUND *Intereſt*, called alſo *intereſt upon intereſt*, is that which is reckoned not only upon the principal, but upon the intereſt itſelf forborne; which hereby becomes a ſort of ſecondary principal. See INTEREST.

COMPOUND *Motion*, that motion which is effected by ſeveral conſpiring powers. Powers are ſaid to conſpire if the direction of the one be not quite oppoſite to that of the other, as when the radius of a circle is conceived to revolve about a centre, and at the ſame time a point to move ſtraight along it.

COMPOUND *Numbers*, thoſe which may be divided by ſome other number beſides unity, without leaving any remainder; ſuch are 18, 20, &c. the firſt being meaſured by the number 2, 6, 9; and the ſecond by the number 2, 4, 5, 10.

COMPOUND *Quantities*. See ALGEBRA.

COMPOUND *Ratio*, is that which the product of the antecedents of two or more ratios has to the product of their conſequents. Thus, 6 to 72 is in a ratio compounded of 2 to 6, and of 3 to 12.

COMPOUND (ſubſtantive), the reſult or effect of a compoſition of different things; or a maſs formed by the union of many ingredients.

COMPREHENSION, in Engliſh church-hiſtory, denotes a ſcheme propoſed by Sir Orlando Bridgman in 1667-8, for relaxing the terms of conformity in behalf of Proteſtant diſſenters, and admitting them into the communion of the church. A bill for this purpoſe was drawn up by Lord Chief-Baron Hale, but diſallowed. The attempt was renewed by Tillotſon and Stillingfleet in 1674, and the terms were ſettled to the ſatiſfaction of the nonconformiſts; but the biſhops refuſed their aſſent. This ſentence was likewiſe revived again immediately after the Revolution; the king and queen expreſſed their deſire of an union: however, the deſign failed after two attempts; and the act of toleration was obtained.

COMPREHENSION, in *Metaphyſics*, is that act of the mind whereby it apprehends or knows any object that is preſented to it, on all the ſides whereon it is capable of being apprehended or known. To comprehend a thing is defined by the ſchoolmen, *rem aliquam totam et totaliter cognoſcere*.

COMPREHENSION, in *Rhetoric*, a trope or figure whereby the name of a whole is put for a part; or that of a part for a whole; or a definite number of any thing for an indefinite.

COMPRESS, in *Surgery*, a bolſter of ſoft linen cloth, folded in ſeveral doubles, frequently applied to cover a plaſter, in order not only to preſerve the part from the external air, but alſo the better to retain the dreſſings or medicines.

COMPRESSION, the act of preſſing or ſqueezing ſome matter together, ſo as to ſet its parts nearer to each other, and make it poſſeſs leſs ſpace. *Compreſſion* properly differs from *condenſation*, in that the latter is performed by the action of cold, the former by ſome external violence.

COMPROMISE, a treaty or contract, whereby two contending parties eſtabliſh one or more arbitrators to judge of and terminate their difference in an amicable manner.

COMPTON, HENRY, biſhop of London, was the youngeſt ſon of Spencer earl of Northamptom, and born in 1632. After the reſtoration of Charles II. he became cornet of a regiment of horſe; but ſoon after quitting the army for the church, he was made biſhop of Oxford in 1674; and about a year after tranſlated to the ſee of London. He was entruſted with the education of the two princeſſes Mary and Anne, whom he alſo afterwards married to the princes of Orange and Denmark; and their firmneſs in the Proteſtant religion was in a great meaſure owing to their tutor, to whom, when Popery began to prevail at court, it was imputed as an unpardonable crime. He was ſuſpended from his eccleſiaſtical function by James II. but was reſtored by him again on the prince of Orange's invaſion. He and the biſhop of Briſtol made the majority for filling the vacant throne with a king: he performed the ceremony of the coronation; was appointed one of the commiſſioners for raiſing the liturgy; and laboured with much zeal to reconcile diſſenters to the church. His ſpirit of moderation made him unpopular with the clergy, and in all probability checked his further promotion. He died in 1713; but living in buſy times, did not leave many writings behind him.

COMPTROLLER. See CONTROLLER.

COMPULSOR, an officer under the Roman emperors diſpatched from court into the provinces, to compel the payment of taxes, &c. not paid within the time preſcribed. The word is formed of the verb *compellere*, "to oblige, conſtrain." Theſe were charged with ſo many exactions, under colour of their office, that Honorius caſhiered them by a law in 412.

The laws of the Viſigoths mention military compulſors; which were officers among the Goths, whoſe buſineſs was to oblige the tardy ſoldiers to go into the fight, or to run to an attack, &c.

Caſſian mentions a kind of monaſtic compulſors, whoſe buſineſs was to declare the hours of canonical office, and to take care the monks went to church at thoſe hours.

COMPUNCTION, in *Theology*, an inward grief in the mind for having offended God. The word comes from *compungere*, of *pungere*, "to prick."—The Romaniſts own their confeſſion inſignificant unleſs attended with compunction or pricking of heart.

Among ſpiritualiſts, compunction bears a more extenſive ſignification; and implies not only a grief for having offended God, but alſo a pious ſenſation of grief, ſorrow, and diſpleaſure, on other motives:—Thus, the miſeries of life, the danger of being loſt in the world, the blindneſs of the wicked, &c. are to pious people motives of compunction.

COMPURGATOR, one that, by oath, juſtifies another perſon's innocence. Compurgators were introduced as evidences in the juriſprudence of the middle ages. Their number varied according to the importance of the ſubject in diſpute, or the nature of the crime with which a perſon was charged.

COMPUTATION, in a general ſenſe, the manner of eſtimating time, weights, meaſure, moneys, or quantities of any kind.—The word is ſometimes alſo uſed among mathematicians in the like ſenſe as calculation.

COMUM, in *Ancient Geography*, a town of the Orobii, of an ancient ſtanding, and formerly powerful, daring to diſpute with the Romans: *Comenſes*, the people; *Comenſis Ager*, the epithet. It became afterwards no inconſiderable municipium, to which Julius Cæſar added 5000 new coloniſts (Strabo); whence it was generally called *Novocomum*, and the people *Novocomenſes*. But in time it recovered its ancient name, *Comum*; Pliny the younger, a native of that place, calling it by no other name. Now *Como*, in the duchy of Milan, at the ſouth end of the lake of that name. E. Long. 9. 37. N. Lat. 46. It is about 80 miles N. E. of Turin.

COMUS, in *Mythology*, the god of jollity or feſtivity. There is great reaſon to believe he was the Chamos of the Moabites; Beel-Phegor, Baal-Peor, Priapus, and Bacchus. He is repreſented under the appearance of a young man, with an inflamed red countenance, his head inclined, and crowned with flowers; his air drowſy; leaning on a huntſman's ſpear in his left hand, and holding an inverted torch in his right. His ſtatue was placed at the chamber doors of new married perſons; his pedeſtal crowned with flowers.

CON, or COND. See COND.

CONANT, DR JOHN, a learned Engliſh divine, born in 1608. He took his degrees at Exeter College Oxford; was, by the parliament, conſtituted one of the aſſembly of divines, though he ſeldom, if ever ſat with them; and in 1657 was admitted vice-chancellor of the univerſity. On the reſtoration he was one of the commiſſioners, and aſſiſted at the conferences in the Savoy; but was deprived by the act of uniformity; after eight years he was confirmed, and was made archdeacon of Norwich, and prebendary of Worceſter. In 1686 he loſt his ſight; and died in 1693; leaving a number of admired ſermons, afterwards publiſhed in ſix volumes.

CONARION, or CONOIDES, a name for the pineal gland. See ANATOMY *Index*.

CONATUS, a term frequently uſed in philoſophy and mathematics, defined by ſome to be a quantity of motion, not capable of being expreſſed by any time or length; as the *conatus recedendi ab axe motus*, is the endeavour which a body, moved circularly, makes to recede, or fly off from the centre or axis of its motion.

CONCA, SEBASTIAN, called *Cavalier*, a celebrated hiſtory and portrait painter, was born at Gaeta in 1679, and placed as a diſciple with Franceſco Solimena, an incomparable maſter. Under his direction Conca exerted his utmoſt induſtry to obtain a proper knowledge of the true principles of the art of painting; nor did he permit any kind of amuſement to withdraw his attention from his ſtudies. Solimena ſoon perceived in his diſciple ſuch talents, and ſuch a diſpoſition, as would qualify him to make a very great progreſs; and on that account he conceived ſo ſtrong an affection for him, that he not only afforded him the beſt inſtructions, but often employed him to ſketch after his own deſigns; took him along with him to Monte Caſſino, where he was to paint a chapel in freſco; and there made Conca acquainted with every thing relative to that manner of painting. At his return to Naples with Solimena, he was, if poſſible, ſtill more aſſiduous to improve himſelf to the utmoſt; and entered on a project that might at once advance his income, and add to his expertneſs in his profeſſion. That project was, to paint portraits in a ſmall ſize and at a low rate; by which ſcheme all ranks of perſons crowded to him; and beſide the pecuniary advantages reſulting from it, he acquired an extraordinary freedom of hand in penciling and colouring; a good habit of imitating nature with an elegant choice; and likewiſe great diverſity of airs of heads, which were of extraordinary uſe to him in his future beautiful compoſitions. As he had a great deſire to ſee Rome, he obtained permiſſion from Solimena to indulge his inclination; and although he was near thirty years of age when he viſited that city, yet he ſpent eight years in conſtant ſtudy after the antiques, after Buonaroti, Raphael, and the Carracci, and perfected himſelf in every part of his profeſſion. The fame of his works ſoon ſpread throughout Rome, and procured him the patronage of Cardinal Ottobuoni, who was a princely encourager of artiſts; and Conca having ſhown an elegant proof of his abilities in a compoſition repreſenting Herod inquiring of the wiſe men the place of the birth of the Meſſiah, the figures being as large as life, the Cardinal thought it ſo excellent a performance, that he rewarded him in a munificent manner, entertained him in his own palace, and introduced him to Pope Clement XI. who appointed Conca to paint the picture of the prophet Jeremiah in the church of St John Lateran; which he executed with univerſal applauſe. On that occaſion the pope was deſirous to give him ſome particular mark of his eſteem; and therefore, in a general aſſembly of the academicians of St Luke, he conferred on him the order of knighthood, and the cardinal preſented him with a rich diamond croſs, which Conca, out of reſpect to his patron, always wore at his boſom. From that time he was inceſſantly employed, and his works were ſolicited by moſt of the princes of Europe. The churches and chapels of every part of Italy are enriched with ſome of his compoſitions; of which he painted an incredible number, as he lived to a very advanced age, and never diſcontinued his labours. He was earneſtly invited by Philip V. of Spain to viſit his court, but he could not be prevailed on to leave Rome. He painted two admirable pieces for the king of Poland, with figures as large as life; in one was repreſented Alexander preſenting Bucephalus to Philip, after he had managed him; a grand compoſition, with a multitude of figures, correctly deſigned, and charmingly grouped and diſpoſed; the whole being adorned with moſt elegant architecture, in true and beautiful perſpective. The other was the marriage of Alexander with Roxana, the daughter of Darius, which was in every reſpect equal to the former. He was at laſt ſo ſtrongly preſſed to go to Naples, that he undertook the journey; and was received in that kingdom with all the reſpect and honour due to his merit; and there he finiſhed ſeveral noble deſigns, as alſo at Gaeta his native city. While he continued at Naples, he received in the royal preſence a ſnuff-box of very great value, preſented to him in the king's name by the marquis of Tanucci, at that time prime miniſter; and in the year 1757, the king was pleaſed to ennoble him and all his deſcendants. At that time he was 78, and it is confidently ſaid, that he died in 1761, aged 82, which is very probable, though not poſitively certain. He underſtood perſpective and architecture thoroughly, and added to it a fine underſtanding of the chiaro-ſcuro. His ſtyle of compoſition is grand and elegant; his deſign very correct; his diſpoſition ingenious; his attitudes and expreſſion full of truth, nature, and variety; and his colouring is excellent. The hiſtory of Diana and Actæon, by Conca, is in the poſſeſſion of the earl of Pembroke at Wilton.

CONCALE BAY, is on the coaſt of France in Brittany, where the Britiſh forces landed in June 1758, in order to go to St Maloes; which they did, and burnt all the ſhips in that harbour, which were above 100, of all ſorts. Concale is the town which gives name to the bay, and is famous for oyſters. It is 18 miles eaſt of St Maloes, and 197 weſt of Paris. W. Long. 1. 47. N Lat. 48. 41.

CONCARNEAU, a town of France, in the department of Finiſterre, with a harbour and a caſtle. E. Long. 4. 2. N. Lat. 47. 46

CONCATENATION, a term chiefly uſed in ſpeaking of the mutual dependence of ſecond cauſes upon each other.

CONCAVE, an appellation uſed in ſpeaking of the inner ſurface of hollow bodies, but more eſpecially of ſpherical ones.

Concave Glaſſes, ſuch as are ground hollow, and are uſually of a ſpherical figure, though they may be of any other, as parabolical, &c. All objects ſeen through concave glaſſes appear erect and diminiſhed.

CONCENTRATION, in general, ſignifies the bringing things nearer a centre. Hence the particles of ſalt, in ſea-water, are ſaid to be concentrated; that is, brought nearer each other, by evaporating the watery part.

CONCENTRIC, in *Mathematics*, ſomething that has the ſame common centre with another: it ſtands in oppoſition to *excentric*.

CONCEPTION, in *Logic*, the ſimple apprehenſion or perception which we have of any thing, without proceeding to affirm or deny any thing about it. Some writers, as Lord Kames, diſtinguiſh between conception and perception; making the latter to denote the conſciouſneſs of an object when preſent, or to include the reality of its object; whereas conception expreſſes the forming an idea of an object whether preſent or abſent, or without any conviction of its reality.

CONCEPTION, in *Medicine*, denotes the firſt formation of the embryo, or fœtus, in the womb.

Conception is no other than ſuch a concourſe and commixture of the prolific ſeed of the male with that of the female, in the cavity of the uterus, as immediately produces an embryo.

The ſymptoms of conception or pregnancy are, when, in a few days after the conjugal act, a ſmall pain is perceived about the naval, and is attended with ſome gentle commotions in the bottom of the abdomen; and within, one, two, three, or even four, months, the menſes ceaſe to flow, or prove in leſs quantity than uſual. Upon the firſt failure of this kind, the woman begins to count the ſeries of her weeks, without taking any notice of the time before elapſed; after this, or between the ſecond or third months, but generally about the third, the motions of the embryo become perceivable to the mother; who hereupon becomes troubled with a nauſea, vomiting, loathing, longing, &c. About this time the breaſts begin to ſwell, grow hard and painful, and contain a little milk; the nipples alſo become larger, firmer, and darker coloured, a livid circle appearing round them; the eyes ſeem ſunk and hollow. During the two firſt months of pregnancy, the woman grows thinner and ſlenderer; the abdomen being alſo depreſſed; though it afterwards diſtends, and grows gradually larger.

The manner wherein conception is effected is thus laid down by the modern writers: In the ſuperficies of the ovaries of women, there are found little pellucid ſpherules, conſiſting of two concentric membranes filled with a lymphatic humour, and connected to the ſurface of the ovaria underneath the tegument, by a thick calyx, contiguous to the extremities of the minute ramifications of the Fallopian tubes.

Theſe ſpherules, by the uſe of venery, grow, ſwell, raiſe and dilate the membrane of the ovary into the form of papillæ; till, the head propending from the ſtalk, it is at length ſeparated from it; leaving behind it a hollow cicatrix in the broken membrane of the ovary; which, however, ſoon grows up again.

Now, in theſe ſpherules, while ſtill adhering to the ovary, fœtuſes have been frequently found; whence it appears, that theſe are a kind of ova, or eggs, deriving their ſtructure from the veſſels of the ovary, and their liquor from the humours prepared therein.

Hence alſo it appears, that the Fallopian tubes being ſwelled and ſtiffened by the act of venery, with their muſcular fimbriæ, like fingers, may embrace the ovaries, compreſs them, and by that compreſſion expand their own mouths: and thus the eggs, now mature, and detached as before, may be forced into their cavities, and thence conveyed into the cavity of the uterus; where they may either be cheriſhed and retained, as when they meet with the male ſeed: or, if they want that, again expelled.

Hence the phenomena of falſe conceptions, abortions, fœtuſes found in the cavity of the abdomen, the Fallopian tubes, &c. For in coition, the male ſeed, abounding with living animalcules, agitated with a great force, a briſk heat, and probably with a great quantity of animal ſpirits, is violently impelled through the mouth of the uterus, which on this occaſion is opener, and through the valves of the neck of the uterus, which on this occaſion are laxer than ordinary, into the uterus itſelf; which now, in like manner, becomes more active, turgid, hot, inflamed, and moiſtened with the flux of its lymph and ſpirits, by means of the titilation excited in the nervous papillæ by the attrition againſt the rugæ of the vagina.

The ſemen thus diſpoſed in the uterus, is retained heated, and agitated, by the convulſive conſtriction of the uterus itſelf; till meeting with the ova, the fineſt and moſt animated part enters through the dilated pores of the membranula of the ovum, now become glandulous; is there retained, nouriſhed, dilated; grows to its umbilicus, or navel; ſtifles the other leſs lively animalcules; and thus is conception effected.

Conception.

Hence it appears, that conception may happen in any part where the ſemen meets with an ovum: thus whether it be carried through the Fallopian tube to the ovary, and there caſt upon the ovum; or whether it meet with it in ſome receſs of the tube itſelf; or, laſtly, whether it join it in the cavity of the uterus, it may ſtill have the ſame effect, as it appears from obſervation actually to have had. But it is probable, that conception is then moſt perfect when the two, viz. the ſemen and ovum, are carried at the ſame time into the uterus, and there mixed, &c.

According to other phyſiologiſts the male ſeed is taken up, before it arrives in the uterus, by the veins which open into the vagina, &c. and thus mixed with the blood; by which, in the courſe of circulation, it is carried, duly prepared, into the ovary, to impregnate the eggs.

It has been advanced by ſeveral writers, that women may poſſibly conceive in their ſleep, and be with child without any knowledge of the occaſion of it. As ridiculous and abſurd as this doctrine may appear to the generality of the world, no leſs an author than Genſili has thought it worthy a particular diſſertation.

Conception, Immaculate, of the Holy Virgin, is a feaſt eſtabliſhed in honour of the holy virgin, particularly with regard to her having been conceived and born *immaculate*, i. e. without original ſin, held in the Romiſh church on the 8th of December. The immaculate conception is the great head of controverſy between the Scotiſts and Thomiſts; the former maintaining, and the latter impugning it. In the three Spaniſh military orders, of St James of the ſword, Calatrava, and Alcantara, the knights take a vow at their admiſſion to defend the immaculate conception. This reſolution was firſt taken 1652. Peter d'Alva has publiſhed 48 huge volumes in folio on the myſteries of the conception.

Conception, an epiſcopal town of Chili in South America. It is ſituated in W. Long. 72. 50. S. Lat. 36. 40; and is the oldeſt European ſettlement in Chili, and the ſecond in point of dignity. On their firſt ſettlement here, the Spaniards were repeatedly driven off by the Indians, ſo that they were obliged to take up their reſidence at St Jago. Since that time both the cities of Conception and St Jago have been frequently deſtroyed by earthquakes. In the year 1751 both of them were laid in ruins by a dreadful ſhock, the firſt concuſſions of which were attended with an unuſual ſwelling of the ſea, that overturned the few houſes which had eſcaped the ravages of the earthquake. The harbour is good and pretty much frequented; on which account the city is regarded as a place of conſequence. The king allows annually 350,000 pieces of eight for the ſupport of a garriſon of 3500 men; a corps that is ſeldom complete. None of the fortifications are conſiderable; but thoſe towards the land are wretched. The Spaniards now live in tolerable ſecurity with reſpect to the Indians, and have no notion of any attack from the land ſide. It is ſaid indeed, that not only this but all the ſettlements in Chili and Peru would fall an eaſy prey to the attacks of a foreign enemy; the fortifications being in ruins, and the garriſons ſcarce half the number required by the king: owing to the avarice, ignorance, and ſupine negligence of the governors, who ſtudy nothing but to enrich themſelves.

Conception, a town of North America in New Spain, and in the audience of Guatimala. It is ſeated near the ſea coaſt, 100 miles weſt of Porto-bello, and a ſmall river that runs into the ſea. W. Long. 81. 45. N. Lat. 10. 0.

CONCERT, or Concerto, in *Muſic*, a number or company of muſicians, playing or ſinging the ſame piece of muſic or ſong at the ſame time.

CONCERTATO intimates the piece of muſic to be compoſed in ſuch a manner, as that all the parts may have their recitativos, be it for two, three, four, or more voices or inſtruments.

CONCERTO grossi, the grand chorus of a concert, or thoſe places where all the ſeveral parts perform or play together.

CONCESSION, in general, ſignifies either the act of granting or yielding any thing, or the thing itſelf which is ſo granted or yielded.

Concession, in *Rhetoric*, a figure, whereby ſomething is freely allowed, that yet might bear diſpute, to obtain ſomething that one would have granted to him, and which he thinks cannot fairly be denied, as in the following conceſſion of Dido, in Virgil:

> "The nuptials he diſclaims, I urge no more;
> "Let him purſue the promis'd Latian ſhore.
> "A ſhort delay is all I aſk him now;
> "A pauſe of grief, an interval from wo."

CONCHA, in *Zoology*, a ſynonyme of the Mytilus, Solen, and other ſhell-fiſh.

CONCHES, a town of Normandy, with a Benedictine abbey, which carries on a conſiderable trade. It is ſeated on the top of a mountain, in the territory of Ouche, 45 miles north-weſt of Paris. E. Long. 0. 51. N. Lat. 48. 58.

CONCHITES marmor, a name given by the ancients to a ſpecies of marble dug near Megara, and remarkable for containing a great number of ſea-ſhells, and other marine bodies immerſed in it.

CONCHOID, in *Geometry*, the name of a curve, given to it by its inventor Nicomedes. See Fluxions.

CONCHOLOGY.

1 Introduction.

IS that department of natural hiſtory which treats of teſtaceous animals. In the Linnæan arrangement it conſtitutes the third order of the claſs of Vermes. This is the order *teſtacea*, of which we propoſe to lay before our readers a pretty full view in the preſent treatiſe. The peculiarity and extent of this order of animals have induced us to conſider it in a ſeparate treatiſe, by which means we ſhall avoid ſwelling out to an inconvenient magnitude, the claſs of Vermes, which will be treated of in its proper place in the courſe of the work.

2 Importance of conchology.

The fine poliſh, ſplendid colours, and elegant form of ſhells, have been long admired, and have procured for them a conſpicuous place in the cabinets of the curious. Indeed in this reſpect, mankind have diſcovered no ſmall degree of folly and extravagance, in the high price which has been given for rare and beautiful ſhells, and often only on account of their rarity. But the ſtudy of conchology acquires a higher degree of importance and utility in another view. In many parts of the world, different kinds of teſtaceous animals are employed as an excellent and nutritious food; and ſome tribes ſupply the table with a delicate luxury. Different ſhells furniſh employment to ingenuity and art, in the manufacture of mother-of-pearl for various purpoſes; and the pearl itſelf, ſo much ſought after as an ornament of dreſs, and often the rival of the richeſt gems, in the eſtimation of mankind, is the production of teſtaceous animals. Its nature and mode of formation, therefore, cannot fail to be objects of curious inveſtigation. But teſtaceous animals and their productions, are not only beneficial and ornamental; ſome are found to be highly pernicious. The ſnail ravages the garden and the field, and marks its progreſs with the deſtruction of ſome of the faireſt of the vegetable tribes; while the ſhip-worm is juſtly the dread of the mariner; ſecure, as it were, in its inſignificance, humbles the glory and pride of man; and labouring in ſecret, demoliſhes the nobleſt efforts of ingenuity. In theſe views, then, the economy and habits of teſtaceous animals, which at firſt ſight might appear a barren and uſeleſs purſuit, become an important and beneficial ſubject of inveſtigation. The following chapters, therefore, ſhall be occupied in the claſſification and natural hiſtory of this tribe of animals.

CHAP. I. HISTORY OF CONCHOLOGY.

3 Cultivated by the ancients.

THE few ſcattered fragments concerning the natural hiſtory of ſhells, or teſtaceous animals, which are to be found in the writings of the ancients, when compared with the more extended and ſyſtematic labours of the moderns, are ſo unimportant and inaccurate, that it would be altogether ſuperfluous to trouble our readers with an account of the information which they contain. It appears, however, from the works of Ariſtotle and Pliny, the great naturaliſts of Greece and Rome, that the ſtudy of conchology was not entirely neglected in their time. It appears too, that admirers and collectors of ſhells were not then wanting. Scipio and Lælius, we are informed, found a relaxation from the toils and cares of war and government, by indulging in this elegant amuſement (A).

4 By the moderns.

Nor will it be attended with much advantage, to give a particular account of the works of the earlier writers on this ſubject, among the moderns. Theſe are Geſner, Johnſton, Rondeletius, Aldrovandus, Bellonius, Wormius, and ſome other authors, who cultivated this department of natural hiſtory, and accompanied their deſcriptions with figures, illuſtrative of the objects which they deſcribed.

The firſt author who attempted a ſyſtematic diviſion of ſhells, according to their external form and characters, was John Daniel Major, profeſſor of medicine in the univerſity of Kiel in Holſtein. His method is publiſhed at the end of his curious and intereſting remarks on the treatiſe concerning the *purpura* of Fabius Columna, printed at Kiel in 1675. The ſyſtem of the German naturaliſt was followed by that of our countryman Dr Liſter, on a more extended and improved plan, which was publiſhed ten years after. Succeeding naturaliſts turned their attention to the ſtudy of conchology, and to the improvement of the claſſification of the numerous objects of this department of natural hiſtory. Such were Buonanni, Rumfius, Langius, Breynius, Tournefort, Gualtieri, D'Argenville, Klein, Linnæus, Adanſon, Geoffroy, and Muller.

We ſhall here exhibit ſome of the moſt celebrated ſyſtems of conchology which have been propoſed by writers on this ſubject. This, we truſt, will not be unacceptable to our readers, and particularly as the works of theſe authors are in few hands, and therefore become leſs acceſſible.

5 Syſtem of Liſter.

I. The firſt general arrangement of ſhells is that publiſhed by Dr Liſter in a work with the following title. *Martini Liſter, M. D. Hiſtoriæ ſive Synopſis methodicæ Conchyliorum libri quatuor, continentes* 1057 *figuras ære nitidiſſime inſculptas, a Suſanna et Anna Liſter depictas.* Londini, 1685—1688, folio. A ſecond edition of the ſame work was publiſhed at Oxford in 1770, with additional figures.

SYSTEM OF LISTER.

LIB. I. *De Cochleis Terreſtribus.*

PARS I. De Buccinis et Turbinibus terreſtribus.

Sect. 1. De Buccinis terreſtribus a ſiniſtra dextrorſum tortilibus, lævibus, edentulis.
Sect. 2. De Buccinis terreſtribus a ſiniſtra dextrorſum tortilibus, edentulis, ſtriatis.
Sect. 3. De Buccinis terreſtribus a ſiniſtra dextrorſum tortilibus, apertura dentata.
Sect. 4. De Buccinis terreſtribus a dextra ſiniſtrorſum tortilibus, apertura plana.
Sect. 5. De Buccinis terreſtribus a dextra ſiniſtrorſum tortilibus, apertura dentata.
Sect. 6. De Turbinibus terreſtribus cochleæformibus, id eſt compactiore figura.

Sect.

(A) Lælium et Scipionem conchas et umbilicos ad Cajetam et ad Laurentum legere conſueſſe, et ad omnem animi remiſſionem ludumque deſcendere. *Cic. de Orat.* lib. ii.

Sect. 7. Trochilus.

Sect. 8. De Turbinibus terreſtribus, compreſſis edentulis, ipſo ambitu acuto.

Sect. 9. De Turbinibus compreſſis, ambitu obtuſiore, apertura edentula.

Sect. 10. De Turbinibus terreſtribus compreſſis, a ſiniſtra dextrorſum tortilibus, apertura dentata.

Sect. 11. De Turbinibus terreſtribus compreſſis, apertura dentata. a dextra ſiniſtrorſum tortilibus apice inverſo ex ipſa aperturæ parte.

Pars II. Cochleæ nudæ terreſtres, limaces quibuſdam dictæ.

Lib. II. *De Turbinibus et Bivalvibus aquæ dulcis.*

Pars I. De Turbinibus.

Sect. 1. De Buccinis fluviatilibus.

Sect. 2. De Cochleis fluviatilibus.

Sect. 3. De Cochleis fluviatilibus compreſſis.

Pars II. De Teſtaceis bivalvibus fluviatilibus.

Sect. 1. De Muſculis fluviatilibus, cardine dentato.

Sect. 2. De Muſculis fluviatilibus, cardine lævi.

Sect. 3. De Pectunculus fluviatilibus.

Lib. III. *De Teſtaceis bivalvibus marinis.*

Pars I. De Teſtaceis bivalvibus, imparibus teſtis.

Sect. 1. Cap. 1. De Pectinibus ex utraque parte æqualiter auritis, ſtriatis. Cap. 2. De Pectinibus æqualiter auritis, lævibus. Cap. 3. De Pectinibus inæqualiter auritis, non dentatis. Cap. 4. De Pectinibus inæqualiter auritis, dentatis.

Sect. 2. Cap. 1. De Oſtreis apophyſi plana longa recurva, angulo acuto deſinente. Cap. 2. De Oſtreis apophyſi brevi, ſubter et quaſi in occulto poſita.

Sect. 3. De Spondylis.

Pars II. De Teſtaceis bivalvibus, paribus teſtis.

Sect. 1. Cap. 1. De Pectinibus margaritiferis. Cap. 2. De Pectinibus, binis apophyſibus longis conjunctis. Cap. 3. De Pectinibus margaritiferis polyginglymis.

Sect. 2 Cap. 1. De Pectunculis polyleptoginglymis, margine ex altera parte productiore. Cap. 2 De Pectunculis polyleptoginglymis, margine rotunda, ſtriatis. Cap. 3. De Pectunculis polyleptoginglymis, margine rotunda, lævibus.

Sect. 3. Cap. 1. De Pectunculis lævibus, triquetris fere, cervice anguſtiore. Cap. 2. De Pectunculis lævibus, triquetris, cervice latiore. Cap. 3. De Pectunculis lævibus, roſtro recurvo.

Sect. 4. Cap. 1. De Pectunculis faſciatis, lunula notatis margine ſtriata. Cap. 2. De Pectunculis faſciatis, lunula quadam notatis, margine lævi. Cap. 3. De Pectunculis faſciatis, ad roſtrum integris.

Sect. 5. Cap. 1. De Pectunculis ſtriatis productioribus, ſtriis a roſtro ad medium uſque dorſum concurrentibus. Cap. 2. De Pectunculis ſtriatis diverſimode exaratus, ſive diſſimilibus. Cap. 3. De Pectunculis ſtriatis, ſtriis ſimilibus, dorſo ad alterum latus paululum eminente. Cap. 4. De Pectunculis ſtriatis, dorſo in aciem compreſſo. Cap. 5. De Pectunculis ſtriatis, muricatis aſperiſve. Cap. 6. De Pectunculis ſtriatis, ſtriis a roſtro tantum deductis lævibus. Cap. 7. De Pectunculis cancellatis. Cap. 8. De Pectunculis ſtriatis, ex latere multo magis diffuſis, latioribus. Cap. 9. De Pectunculis ſtriatis, ex latere diffuſis anguſtioribus. Cap. 10. De Pectunculis ſtriatis imbricatis.

Sect. 6. Cap. 1. De Muſculis marinis, cardine lævi minimeque dentato. Cap. 2. De Muſculis marinis polyleptoginglymis.

Sect. 7. Cap. 1. De Pinnis, margine velut præciſa obtuſave. Cap. 2. De Pinnis, margine producta et auctiore.

Sect. 8. Cap. 1. De Tellinis, id eſt conchis fere cuneiformibus, ambitu ſerrata. Cap. 2. De Tellinis quibus ambitus ex interna parte lævis eſt.

Sect. 9. De Solenis, id eſt conchis tenuibus longiſſimiſque ab utraque parte naturaliter hiantibus.

Sect. 10. Cap. 1. De Chamis, ab altero tantum latere fere naturaliter hiantibus. Cap. 2. De Chamis pholadibus.

Pars II. De Teſtaceis multivalvibus.

Sect. 1. Cap. 1. De Pholadibus triumve teſtarum conchis, cardinibus loculis quibuſdam quaſi perforatis. Cap. 2. De Pholadibus, cardine integro.

Sect. 2. De Conchis quinque teſtarum anatiferis pleriſque dictis.

Sect. 3. De Balanis, id eſt, duodecim teſtarum conchis præter operculum mitratum.

Sect. 4. Sive appendix ad librum tertium de conchitis iiſve lapidibus, qui quandum ſimilitudinem cum conchis marinis habeant.

Lib. IV. *De Buccinis marinis, quibus etiam vermiculi dentalia et patellæ, numerantur.*

Sect. 1. Cap. 1. De Patellis, vertice perforato. Cap. 2. De Patellis, vertice integro, lævibus. Cap. 3. De Patellis, vertice integro, ſtriatis, margine quaſi radiata. Cap. 4. De Patellis, vertice adunco margine æquali. Cap. 5. De Patellis, vertice adunco, margine obliqua. Cap. 6. De Patellis, vertice adunco, quibus ex interna parte cavitas quædam quaſi arcuata, longis compreſſis. Cap. 7. De Patellis, vertice acuto, ſtilo quodam interno donatis.

Sect. 2. De Dentalibus.

Sect. 3. De Vermiculis.

Sect. 4. Cap. 1. De Nautilis caudatis, ſive e plurimis tabulatis confectis. Cap. 2. De Nautilis vacuis, ſive non tabulatis.

Sect. 5. Cap. 1. De Cochleis marinis, apice brevi, umbilicatis, ſinu aurito. Cap. 2. De Cochleis marinis, apice brevi, umbilico ſimplici. Cap. 3. De Cochleis marinis, apice brevi, centro minime ſinuato. Cap. 4. De Cochleis marinis, baſi brevi, apice ad oris initium parum elato. Cap. 5. De Cochleis marinis, apice mediocriter producto, ore dentato. Cap. 6. De Cochleis marinis, apice mediocriter producto, ore edentulo, lævibus. Cap. 7. De Cochleis marinis, apice mediocriter producto, ſtriatis. Cap. 8. De Cochleis marinis, clavicula tenui et longiſſima, ſtriatis. Cap. 9. De Cochleis marinis, clavicula tenui et longiſſima, lævibus.

Sect. 6. Cap. 1. De Neritis dentatis, clavicula paululum prominente. Cap. 2. De Neritis dentatis, clavicula compreſſa, ſtriatis. Cap. 3. De Neritis dentatis, clavicula compreſſa, lævibus. Cap. 4. De Neritis ad columellam dentatis, labio productiore

edentulo. Cap. 5. De Neritis edentulis lævibus. Cap. 6. De Neritis edentulis muricatis.

Sect. 7. De Auribus marinis.

Sect. 8. Cap. 1. De Trochis pyramidalibus, apertura ſive baſi leviter tumida. Cap. 2. De Trochis pyramidalibus, baſi paululum cava ſive ſinuata. Cap. 3. De Trochis, apertura ſive baſi plana. Cap 4. De Trochis brevioribus, umbilicatis, dentatis. Cap. 5. De Trochis cochleæformibus, umbilicatis, edentulis. Cap. 6. De Trochis clavicula breviore, columella paulo erectiore integra. Cap. 7. De Trochis, baſi media leviter tumida, quaſi altera clavicula. Cap. 8. De Trochis, unico dente ad columellam acuto.

Sect. 9. Cap. 1. De Conchis venereis unicoloribus. Cap. 2. De Conchis venereis, lineis nigris ſecundum longitudinem depictis. Cap. 3. De Conchis undatim depictis. Cap. 4. De Conchis venereis faſciatis, immaculatis ; et de conchis venereis faſciatis et maculatis, aut alias cum faſciis variegatis. Cap. 5. De Conchis venereis, punctis nigris diſtinctis. Cap. 6. De Conchis venereis, maculis albis nigriſve interſperſis inſignitis ; et de conchis venereis maculis albis quaſi reticulatim depictis. Cap. 7. De Conchis venereis, ſtriis eminentibus conſpicuis. Cap. 8. De Conchis venereis, punctis elatis exaſperatis, nodiſve inæqualibus. Cap. 9. De Conchis venereis, apertura non denata, baſi integra. Cap. 10. De Conchis venereis, baſi umbilicata cochleata.

Sect. 10. Cap. 1. De Rhombis cylindraceis columella dentata, craſſis, unius coloris. Cap. 2. De Rhombis cylindraceis dentatis, maculoſis. Cap. 3. De Rhombis cylindraceis dentatis, faſciatis. Cap. 4. de Rhombis cylindraceis dentatis, undatis. Cap. 5. De Rhombis cylindraceis dentatis, dorſo gibboſo. Cap. 6. De Rhombis cylindraceis eduntulis, ore ſtrictiore. Cap. 7. De Rhombis edentulis tenuibus, ore patulo, clavicula paululum exſerta. Cap. 8. De Rhombis edentulis, ore patulo, clavicula compreſſa.

Pars II. Cap. 1. De Rhombis cylindrico-pyramidalibus, unius coloris. Cap. 2. De Rhombis cylindrico-pyramidalibus, quibus lineæ maculatæ circum injiciuntur. Cap. 3. De Rhombis cylindrico-pyramidalibus, ſtriatis. Cap. 4. De Rhombis cylindrico-pyramidalibus, undatis. Cap. 5. De Rhombis cylindrico-pyraimdalibus, faſciatis. Cap. 6. De Rhombis cylindrico-pyramidalibus, reticulatis. Cap. 7. De Rhombis cylindrico-pyramidalibus, dentatis.

Sect. 11. Cap. 1. De Buccinis perſicis dictis. Cap 2. De Buccinis muſicis dictis. Cap. 3. De Buccinis columella dentata, clavicula longiſſima et tenuiſſima

Sect. 12. Cap. 1. De Buccinis bilinguibus, lævibus. Cap. 2. De Buccinis bilinguibus, ſtriatis. Cap. 3. De Buccinis bilinguibus, aſperſis et muricatis. Cap. 4. De Buccinis bilinguibus, digitatis.

Sect. 13. Cap. 1. De Buccinis ampullaceis lævibus, aut certe minus aſperis. Cap. 2. De Buccinis ampullaceis, muricatis. Cap. 3. De Buccinis ampullaceis, ad ſiniſtram convolutis.

Sect. 14 Cap. 1. De Buccinis utrinque productioribus, lævibus. Cap. 2. De Buccinis utrinque productioribus, ſtriis denſis et tenuioribus exaſperatis. Cap. 3. De Buccinis utrinque productioribus, ſtriis paucioribus donatis, labro ſimplici. Cap. 4. De Buccinis utrinque productioribus, ſtriis paucioribus, labro duplicato donatis. Cap. 5. De Buccinis utrinque productioribus, muricatis.

Sect. 15. Cap. 1. De Buccinis breviroſtris, nodoſis. Cap. 2. De Buccinis breviroſtris, ſtriatis. Cap. 3. De Buccinis breviroſtris, lævibus, fere clavicula productiore. Cap. 4. De Buccinis breviroſtris, labro repando, tenuibus. Cap. 5. De Buccinis breviroſtris, labro repando, craſſis. Cap. 6. De Buccinis breviroſtris, compreſſis. Cap. 7. De Buccinis auritis, ſive roſtro recurvo donatis, ventriculoſis. Cap. 8. De Buccinis breviroſtris, ſinu reflexo, lævibus. Cap. 9. De Buccinis breviroſtris, roſtro reflexo, clavicula productiore.

Sect. 16. Seu appendix de buccinitis, iiſve lapidibus que buccina omnigena valde referant.

6 Of Langius.

II. In 1722, Langius preſented to the world the following work on conchology. '*Caroli Nicolai Langii Lucernen. Helvet. Phil. et Med. &c. Methodus nova, et facilis teſtacea marina plæraque, quæ huc uſque nobis nota ſint, in ſuas debitas et diſtinctas claſſes, genera, et ſpecies, diſtribuendi, nominibuſque ſuis propriis, ſtructuræ potiſſimum accommodatis nuncupandi, &c. Lucernæ*, 1722. 4to. p. 102.

SYSTEM OF LANGIUS.

PARS PRIMA. *Teſtacea marina univalvia non turbinata.*

CLASSIS PRIMA. Teſtacea marina univalvia non turbinata, et in ſe non contorta.

Sect. 1. Teſtacea marina univalvia non turbinata, et in ſe non contorta nullo modo, vel ſolummodo in ſummo apice tantillum incurvata. Gen. 1. Patellæ. Gen. 2. Balani.

Sect. 2. Tubuli marini, ſeu teſtacea marina univalvia, non turbinata, et in ſe non contorta, elongata tubuli inſtar concava. Gen. 1. Penicilla. Gen. 2. Dentales. Gen. 3. Tubuli radiciformes. Gen. 4. Tubuli vermiculares.

CLASSIS SECUNDA. Teſtacea marina univalvia, non turbinata, ſed ita in ſe contorta, ut eorum ſpiræ non promineant.

Sect. 1. Teſtacea marina univalvia ita in ſe tranſverſim, vel oblique ſecundum longitudinem contorta, ut eorum circumvolutiones vix appareant. Gen. 1. Nautili. Gen. 2. Nuces marinæ.

Sect. 2. Porcellanæ, ſeu teſtacea marina univalvia non turbinata. Gen. 1. Porcellanæ vulgares. Gen. 2. Porcellanæ fimbriatæ. Gen. 3. Porcellanæ ſpirales. Gen. 4. Porcellanæ thoracicæ. Gen. 5. Porcellanæ minores integræ.

Sect. 3. Diviſ. 1. Cornua ammonis, quæ ſunt teſtacea marina univalvia non turbinata, et ſerpentum in modum in ſe contorta, ut eorum circumvolutiones nulla ex parte promineant, et tamen ex utroque latere omnes appareant. Gen. 1. Cornua ammonis unita. Gen. 2. Cornua ammonis anomala. Diviſ. 2. Gen. 1. Cornua ammonis ſimpliciter diviſa. Gen. 2. Cornua ammonis integra diviſa.

PARS SECUNDA. *Cochleæ marinæ, ſeu teſtacea marina univalvia turbinata, quæ unica tantum conſtant valva et figura ſua cochlearum in modum intorta ſunt, ita ut intima eorum ſpira aliquo ſaltem modo promineat et producatur.*

CLASSIS PRIMA. Cochleæ marinæ longæ, ſeu cochleæ marinæ ore admodum elongato et ſuperius aperto.

Sect. 1. Cochleæ marinæ longæ ore labiis rectis. Gen. 1. Cochleæ pyramidales. Gen. 2. Cochleæ cylindroideæ.

Sect. 2. Cochleæ longæ pyriformes, ſeu cochleæ marinæ longæ ore labiis leviter incurvatis, ideoque etiam leviter ventricoſis. Diviſ. 1. Cochleæ longæ pyriformes minores. Gen. 1. Cochleæ longæ pyriformes minores, vulgares. Gen. 2. Cochleæ longæ pyriformes minores intortæ integræ. Gen. 3. Cochleæ longæ pyriformes minores intortæ et inſulcatæ. Diviſ. 2. Cochleæ longæ pyriformes majores. Gen. 1. Cochleæ longæ pyriformes majores vulgares. Gen. 2. Cochleæ longæ pyriformes majores, intortæ integræ. Gen. 3. Cochleæ longæ pyriformes majores intortæ cylindroideæ.

CLASSIS SECUNDA. Cochleæ canaliculatæ, ſeu cochleæ marinæ ore elongato et ſuperius in canaliculum abeunte.

Sect. 1. Cochleæ marinæ canalicula recta. Gen. 1. Cochleæ canaliculatæ rectæ tenuiores. Gen. 2. Cochleæ canaliculatæ rectæ craſſiores. Gen. 3. Purpuræ rectiroſtræ.

Sect. 2. Cochleæ marinæ canaliculatæ incurvatæ. Gen. 1. Cochleæ canaliculatæ introrſum incurvatæ. Gen. 2. Cochleæ canaliculatæ extrorſum incurvatæ. Gen. 3. Murcius. Gen 4. Cochleæ muriciformes inſigniter incriſpatæ. Gen. 5. Purpuræ curviroſtræ. Gen 6. Cochleæ caſſidiformes umbilicatæ. Gen. 7. Caſſidæ.

CLASSIS TERTIA. Buccina ſunt cochleæ marinæ ore et mucrone ſimul elongatis, primaque ſpira notabiliter ventricoſa.

Sect. 1. Buccina parva mucrone mediocriter elongato et tenuiter acuminato. Gen. 1. Buccina parva pruniformia acuminata. Gen. 2. Buccina parva pruniformia canaliculata. Gen. 3. Buccina parva curviroſtra. Gen. 4. Buccina parva ſulcata. Gen. 5. Buccina parva ſulcata et canaliculata. Gen. 6. Buccina parva integra ore perpendiculari. Gen. 7. Buccina parva integra ore obliquo.

Sect. 2. Buccina majora, quæ ſunt buccina mucrone admodum elongato et acuminato. Gen. 1. Buccina majora canaliculata roſtrata, ore ſimplici. Gen. 2. Buccina majora canaliculata, ore labioſo. Gen. 3. Buccina majora canaliculata roſtrata, ore labioſo, fimbriata. Gen. 4. Buccina majora canaliculata et ſulcata.

CLASSIS QUARTA. Strombi, qui ſunt cochleæ marinæ ore et mucrone ſimul inſigniter elongatis, et prima ſpira notabiliter anguſtiore quam in buccinis.

Sect. 1. Strombi ore ſuperius aperto. Gen. 1. Strombi canaliculati acuminati. Gen. 2. Strombi canaliculati roſtrati, ore ſimplici. Gen. 3. Strombi canaliculati roſtrati, ore anguloſo. Gen. 4. Strombi canaliculati roſtrati, ore labioſo. Gen. 5. Strombi ſulcati vulgares. Gen. 6. Strombi ſulcati, ore labioſo.

Sect. 2. Strombi integri, ore ſuperius clauſo, ſeu integro. Gen. 1. Strombi integri vulgares, ore ſimplici. Gen. 2. Strombi integri, ore labioſo. Gen. 3. Strombi integri, ore fimbriato et dentato.

CLASSIS QUINTA. Cochleæ marinæ, ore admodum brivi ſeu parvo, mucrone vero inſigniter elongato.

Sect. 1. Turbines aperti, ſeu cochleæ marinæ, ore admodum brevi ſeu parvo ſuperius aperto, mucrone longiſſimo. Gen. 1. Turbines apertilati. Gen. 2. Turbines aperti acuminati. Gen. 3. Turbines aperti canaliculati recte roſtri. Gen. 4. Turbines aperti canaliculati oblique incurvati. Gen. 5. Turbines aperti ſulcati.

Sect. 2. Turbines integri, ore ſuperius clauſo ſeu integro. Gen. 1. Turbines integri vulgares. Gen. 2. Turbines integri acuminati. Gen. 3. Turbines integri fimbriati.

Sect. 3. Trochi ſeu cochleæ marinæ ore admodum brevi, ſeu parvo e baſi lata et quaſi plana in mucronem quaſi rectilineam conoideum inſigniter elongatum abeuntes. Gen. 1. Trochi ore anguſto et horiſontaliter compreſſo. Gen. 2. Trochi ore ampliore et ſubrotundo.

CLASSIS SEXTA. Cochleæ marinæ breviores, ſeu cochleæ marinæ ore et mucrone breviores, magiſque contracto.

Sect. 1. Cochleæ breviores proportionatæ. Gen. 1. Cochleæ trochiformes breviores proportionatæ et mucronatæ. Gen. 2. Cochleæ marinæ terreſtriformes breviore proportionatæ. Gen. 3. Cochleæ depreſſæ.

Sect. 2. Cochleæ marinæ breviores perpendiculariter anomalæ. Gen. 1. Neritæ. Gen. 2. Cochleæ umbilicatæ foramine ſpirarum ſemicirculari. Gen. 3. Cochleæ umbilicatæ foramine ſpirarum rotundo.

Sect. 3. Cochleæ marinæ breviores horiſontaliter anomalæ. Gen. 1. Cochleæ planæ. Gen. 2. Aures marinæ.

Sect. 4. Varia hucuſque enarratarum cochlearum opercula quæ aut propter uſum aut propter ſingularem ſtructuram, magis nota ſunt. Gen. 1. Opercula cochlearum marinarum ſubrotunda. Gen. 2. Ungues marini, ſeu opercula cochlearum marinarum oblonga.

PARS TERTIA. *Conchæ marinæ, id eſt teſtacea marina bivalvia quæ duabus conſtant valvis in cardine, articulatione quadam inter ſe conjunctis, ut commode claudi et aperiri queant.*

Sect. 1. Conchæ marinæ notabiliter umbonatæ et recta incurvatæ. Gen. 1. Conchæ marinæ valvis æqualibus æquilateræ. Gen. 2. Conchæ cordiformes umbone cardinum deducto. Gen. 3. Conchæ marinæ cordiformes æquilateræ, umbone cardinum unito.

Sect. 2. Conchæ marinæ valvis æqualibus æquilateræ leviter umbonatæ. Gen. 1. Conchæ craſſæ. Gen. 2.

Pectines tenues. Gen. 3. Pectunculi. Gen. 4. Conchæ pectiniformes æquilateræ ſubrotundæ. Gen. 5 Conchæ pectiniformes æquilateræ.

Sect. 3. Conchæ marinæ valvis æqualibus æquilateræ, notabiliter umbonatæ et oblique incurvatæ. Gen. 1. Conchæ marinæ incurvatæ ſubrotundæ vulgares. Gen. 2. Chamæ æquilateræ.

Sect. 4. Conchæ marinæ, valvis æqualibus æquilateræ leviter umbonatæ et oblique incurvatæ. Gen. 1. Conchæ marinæ valvis æqualibus ſubrotundæ. Gen. 2. Tellinæ æquilateræ.

Sect. 5. Pinnæ, ſeu conchæ marinæ valvis æqualibus æquilateræ, cardine umbone deſtituta. Gen. 1. Pinnæ rectæ. Gen. 2. Pinnæ incurvatæ.

Classis Secunda. Conchæ inæquilateræ, ſeu conchæ marinæ valvis æqualibus ex utroque cardinis latere inæqualiter effuſæ.

Sect. 1. Conchæ marinæ valvis æqualibus inæquilateræ notabiliter umbonatæ, et recta incurvatæ. Gen 1. Conchæ marinæ valvis æqualibus inæquilateræ ſubrotundæ. Gen. 2. Conchæ marinæ cordiformes inæquilateræ, umbone cardine deducto. Gen. 3. Conchæ marinæ cordiformes inæquilateræ, umbone cardinum unito.

Sect. 2. Conchæ marinæ valvis æqualibus inæquilateræ, leviter umbonatæ et rectæ incurvatæ. Gen. 1. Conchæ marinæ leviter umbonatæ et recta incurvatæ ſubrotundæ.

Sect. 3. Conchæ marinæ valvis æqualibus inæquilateræ, notabiliter umbonatæ et oblique incurvatæ, ſubrotundæ vulgares. Gen. 1. Chamæ inæquilateræ. Gen. 2. Conchæ rhomboidales.

Sect. 4. Conchæ marinæ valvis æqualibus inæquilateræ leviter umbonatæ et oblique incurvatæ. Gen. 1. Conchæ marinæ, &c. ſubrotundæ. Gen. 2. Conchæ pectiniformes inæquilateræ triangulares. Gen. 3. Tellinæ inæquilateræ. Gen. 4. Conchæ tellinæformes. Gen. 5. Muſculi. Gen. 6. Conchæ longæ rugoſæ. Gen. 7. Conchæ ſoleniformes. Gen. 8. Mytili.

Sect. 5. Conchæ marinæ valvis æqualibus inæquilateræ, leviter umbonatæ et oblique incurvatæ, ſtructura et ſtriis peculiaribus. Gen. 1. Conchæ imbricatæ. Gen. 2. Pholades. Gen. 3. Dactyli. Gen. 4. Hyſteroconchæ. Gen. 5. Conchæ alæformes. Gen. 6. Conchæ quadratæ.

Sect. 6. Conchæ inæquilateræ non umbonatæ, ſeu conchæ marinæ valvis æqualibus inæquilateræ, cardine umbonæ diſtituto. Gen. 1. Solenes. Gen. 2. Conchæ marinæ &c. ſtructura peculiari.

Classis Tertia. Conchæ anomalæ, ſeu conchæ marinæ valvis inæqualibus.

Sect. 1. Conchæ marinæ anomalæ umbonatæ et auritæ. Gen. 1. Pectines anomali. Gen. 2. Spondyli.

Sect. 2. Oſtreæ, ſeu conchæ marinæ anomalæ omnino non vel irregulariter tantum umbonatæ rugoſæ Gen. 1. Oſtrea vulgaris. Gen. 2. Oſtrea denticulata. Gen. 3. Oſtrea roſtrata. Gen. 4. Oſtrea peculiaris.

7 Of Breynius.

III. A different ſyſtem was propoſed for the claſſification of teſtaceous animals by Breynius, in the following work, which was publiſhed in the year 1732. *Joannis Philippi Breynii diſſertatio phyſica de polythalamiis, nova teſtaceorum claſſe, cui quædam præmittuntur de methodo teſtacea in claſſes et genera diſtribuendi : huic adjicitur commentatiuncula de belemnitis pruſſicis, tandemque ſchediaſma de Echinis methodice diſponendis ; Gedani,* 1732, 4to.

SYSTEM of BREYNIUS.

In this ſyſtem the author has divided ſhells into the eight following claſſes, viz. 1. Tubulus. 2. Cochlidium. 3. Polythalamium. 4. Lepas. 5. Concha. 6. Conchoides. 7. Balanus. 8. Echinus.

1. *Tubulus*, eſt teſta tubuloſa monothalamia, vel in lineam rectam extenſa, vel incurva, vel contorta, vel aliquando ad ſpiram, ſed irregulariter, accedens. Huic pertinent dentalia, entalia, ſolenes univalvi, &c.

2. *Cochlidium*, eſt teſta tubuloſa, monothalamia, conica, inſpirans conſtanter regularem, convoluta aliquando opercula prædita, ſepius vero eo diſtituta. Ad hanc claſſem ſpectant nautili tenues ſive vacui vulgo dicti ; aures marinæ, neritæ, cochleæ, buccina, murices, caſſides, cylindri, volutæ, porcellanæ, et omnes teſtæ turbinatæ, exceptis nautilo et anomia, ad claſſem tertiam referendis.

3. *Polythalamium*, eſt teſta tubuloſa polythalamia, conica, recta, vel in ſpiram regularem convoluta, cum ſyphunculo thalamos tranſeunte : huic reducendi nautili anomia, litui, et orthocerata.

3. *Lepas*, eſt teſta vaſculoſa ſimplex, referens vaſculum magis minuſve cavum, orificio multum patenta, ut patellæ ſimileſque.

5. *Concha*, eſt teſta vaſculoſa compoſita bivalvis, id eſt quæ ex duabus componitur valvis, ſive vaſculis magis minuſve concavus in cardine articulatione quadam inter ſe junctis ut aperiri et claudi queant ; ut chamæ, mytili, tellinæ, pinnæ, oſtreæ, pectines anomiæ.

6. *Conchoides*, eſt teſta vaſculoſa compoſita bivalvis, ſed quæ præterea et aliquot minoribus portiunculis teſtaceis componitur, ut pholades anatiferæ.

7. *Balanus*, eſt teſta vaſculoſa compoſita quæ preter unicam teſtam majorem alias portiones minores habet ex quibus componitur, ut balanus vulgo dictus.

8. *Echinus*, eſt teſta vaſculoſa compoſita, undique clauſa ; magis minuſve concava, duobus tantum foraminibus ſeu aperturis pro ore et ano perforata, externe aculeis vel claviculis mobilibus teſtaceis armata.

8 Of Tournefort.

IV. The ſyſtem of Tournefort appeared for the firſt time, and was publiſhed from the author's manuſcript in the treatiſe on conchology by Gualtieri. In this ſyſtem ſhells are divided into three claſſes, viz. Monotoma, Ditoma, and Polytoma.

SYSTEM of TOURNEFORT.

Teſtacea dicuntur quorundam animalium integumenta, quæ teſtæ ſeu lateris duritiem habent, et in quibus tantum, in teſta animalia vivant.

Teſtacea autem omnia quæ hucuſque in muſæis curioſorum adverſari et congeri ſolent, ad tres claſſes facile revocari poſſunt. Hæc enim vel monotoma ſunt, vel ditoma, vel polytoma.

Monotoma teſtacea appellantur ea quorum teſta indiviſa eſt ; ditoma quæ geminis conſtant teſtis ad cardinem connixis; polytoma vero quæ ex pluribus ſimul adnexis compinguntur.

Classis Prima. Quæ teſtacea monotoma complectitur. Teſtacea monotoma quorum teſta indiviſa eſt, in tres familias abeant: alia enim univalvia ſunt, alia ſpiralia, alia fiſtuloſa.

Familia I. *Teſtaceorum univalvium.* Monotoma univalvia dicimus quorum teſta ſimplex eſt in os amplius eſfuſa. Gen. 1. Lepas. Gen. 2. Eruca.

Familia II. *Teſtaceorum ſpiralium.* Monotoma ſpiralia dicimus teſtacea quorum pars inferior in ſpiram contorquetur: horum autem ſpiræ ſeu helices exterius patent, et ſimpliciter ſpiralia dicuntur, vel eorum ſpira intus reconditur, et convoluta dicuntur.

Divis. 1. Teſtacea monotoma ſimpliciter ſpiralia, ſeu quorum ſpira exterior eſt. Gen. 1. Murex. Gen. 2. Murex alatus. Gen. 3. Murex aporrhais. Gen. 4. Murex venereus. Gen. 5. Murex pyramidaiis. Gen. 6. Buccinum. Gen. 7. Buccino-murex. Gen. 8. Purpura. Gen. 9. Buccino-purpura. Gen. 10. Peribolus. Gen. 11. Turbo. Gen. 12. Verticillus. Gen. 13. Cochlea. Gen. 14. Cochlea terreſtris. Gen. 15. Ceratites. Gen. 16. Cochlea marina. Gen. 17. Nerita. Gen. 18. Auris marina.

Divis. 2. Teſtacea monotoma ſpiralia convoluta, quæ cochleam interiorem habent vix foris conſpicuam. Gen. 1. Concha venerea. Gen. 2. Concha perſica. Gen. 3. Nautilus. Gen. 4. Conchilium.

Familia III. *Teſtaceorum fiſtuloſorum.* Teſtacea monotoma fiſtuloſa ſeu tubuloſa, ut ex nomine patet, fiſtulæ in modum tenuantur. Gen. 1. Dentale. Gen. 2. Entale. Gen. 3 Tubuli marini.

Classis Secunda, quæ teſtacea ditoma continet. Teſtacea ditoma ſemper ex duabus teſtis ad cardinem articulatis compinguntur, et vel arcte undique clauduntur, vel utrinque hiant; unde in duas familias dividi poſſunt.

Familia I. Teſtaceorum ditomorum quæ arcte clauduntur. Gen. 1. Concha. Gen. 2. Conchula. Gen. 3. Oſtreum Gen. 4. Mytilus. Gen. 5. Pinna. Gen. 6. Perna. Gen. 7. Pholas. Gen. 8. Pecten. Gen. 9. Pectunculus.

Familia II Teſtaceorum ditomorum quæ ſemper hiant. Gen. 1. Chamæ. Gen. 2. Solen.

Classis Tertia, quæ teſtacea polytoma continet. Polytoma teſtacea dicuntur quorum teſtæ ex pluribus partibus vel articulatis, vel per cartilaginem connexis compinguntur; unde in duas familias abeunt.

Familia I. Eorum quorum partes articulantur. Gen. 1. Echinus.

Familia II. Eorum quorum partes per cartilaginem connectuntur. Gen. 1. Balanus.

9 Of D'Argenville.

V. M D'Argenville in 1742, publiſhed at Paris a treatiſe on Conchology with 33 plates. A ſecond edition of the ſame work appeared at Paris in 1757. In this edition the number of the plates was increaſed to 41. A more ſplendid edition was publiſhed after the death of the author, by M. M. de Favanne de Montcerville father and ſon. This edition is extended to 3 volumes, two of which conſiſt of letter preſs, and the 3d contains the engravings, which are 80 in number, and are executed with great accuracy and elegance. But the deſcriptions of the genera and ſpecies only reach the 10th plate; ſo that the work which was publiſhed in 1780 is ſtill unfiniſhed.

SYSTEM of D'ARGENVILLE.

In this ſyſtem ſhells are divided into four parts. I. Sea-ſhells. II. Freſh water-ſhells. III. Land-ſhells. IV. Foſſil-ſhells.

Part I. Sea-ſhells are divided into 3 Claſſes. 1. Univalves. 2. Bivalves. 3. Multivalves.

Claſs I. contains 15 families; viz. 1. Lepas. 2. Oreilles de mer. 3. Tuyaux et Vermiſſeaux de mer. 4. Nautiles. 5. Limaçons à bouche ronde. 6. Limaçons à bouche demi-ronde. 7. Limaçons à bouche aplatie. 8. Cornets ou Volutes. 9. Olives ou Cylindres. 10. Rochers ou Murex. 11. Tonnes. 12. Porcelaines. 13. Buccins. 14. Pourpres. 15. Vis.

Claſs II. contains 7 families, viz. 1. Huitres. 2. Cames. 3. Tellines. 4. Moules. 5. Cœurs. 6. Peignes. 7. Manches de couteaux.

Claſs III. conſiſts of 7 families, viz. 1. Oſcabrions, ou lepas à huit pieces. 2. Ourſins. 3. Glands de mer. 4. Pouſſe-pieds. 5. Conques anatiferes. 6. Pholades. 7. Tuyaux de mer multivalves.

Part II. Freſh-water-ſhells are divided into 2 Claſſes. 1. Univalves. 2. Bivalves.

Claſs I. contains 8 families, viz. 1. Lepas. 2. Nautiles ou cornes d'ammon. 3. Limaçons à bouche ronde. 4. Limaçons à bouche demi-ronde. 5. Limaçons à bouche triangulaire. 6. Tonnes. 7. Buccins. 8. Vis.

Claſs II. is compoſed of two families. 1. Cames. 2. Tellines.

Part. III. Land-ſhells, conſtituting a ſingle claſs. viz. Univalves, which contains 6 families; viz. 1. Lepas. 2. Limaçons à bouche ronde. 3. Limaçons à bouche demi-ronde. 4. Limaçons à bouche aplatie. 5. Buccins. 6. Vis.

Part IV. Foſſil ſhells, which conſiſt of 3 claſſes. 1. Univalves. 2. Bivalves. 3 Multivalves.

Claſs I. is compoſed of 15 families having the ſame names as the firſt claſs of ſea-ſhells.

Claſs II. contains 7 families ſimilar to the 2d claſs of ſea-ſhells.

Claſs III. conſiſts of 5 families, viz. 1. Ourſins. 2. Glands de mer. 3. Pouſſe-pieds. 4 Pholades. 5. Tuyaux multivalves.

VI. A ſyſtem of Conchology was publiſhed by Klein in 1753, and illuſtrated with engravings. In the ſame work the author enters into an inveſtigation concerning the formation, increaſe, and colours of ſhells. The following is an abridged view of this arrangement. 10 Of Klein.

SYSTEM

SYSTEM of KLEIN.

In this ſyſtem, ſhells are divided into 6 parts.

Part I. which is entitled Cochlis, is divided into 2 ſections, viz. Cochlis ſimplex, and Cochlis compoſita.

Sect. I. conſiſts of 8 claſſes, viz. 1. Cochlis plana, containing 4 genera 2. Cochlis convexa, 6 genera. 3. Cochlis fornicata, 5 genera 4. Cochlis elliptica, 6 genera. 5. Cona cochlis, 16 genera. 6. Cochlea. 8 genera. 7. Buccinum, 5 genera. 8. Turbo, 14 genera.

Sect. II. Conſiſts of five claſſes, viz. 1. Cochlis roſtrata, 7 genera. 2. Voluta longa, 15 genera. 3. Voluta ovata, 8 genera. 4. Alata, 6 genera. 5. Murex, 2 genera.

Part. II. Concha is alſo divided into 2 ſections, viz. Monoconchæ and Diconchæ æquales.

Sect. I. contains 2 claſſes, viz. 1. Patella, 2 genera. 2. Anſata, 4 genera.

Sect. II. conſiſts of three ſubdiviſions, viz. 1. Diconchæ conniventes. 2. Diconchæ interruptæ. 3. Diconchæ inæquales.

Subdiv. 1. is compoſed of 6 claſſes, viz. 1. Diconchæ figuratæ, 4 genera. 2. Oſtreum, 6 genera. 3. Muſculus, 3 genera. 4. Cyclas. 5. Diconcha aurita, 9 genera. 6. Diconchæ cordiformes, 3 genera.

Subdiv. 2. conſiſts of 5 claſſes, viz. 1 Diconcha ſulcata. 2. Diconchæ umbilicatæ, 3 genera. 3. Diconchæ ſinu profundo, ſeu chamæ, 3 genera. 4. Diconchæ ſinu prominulo, ſeu tellinæ, 6 genera. 5. Pyloris, 9 genera.

Subdiv. 3. Diconchæ inæquales, 7 genera.

Part III. Polyconchæ conſiſts only of one genus.

Part IV. Niduli Teſtacei comprehends one claſs, viz. Balanus, which includes 4 genera.

Part V. Echinus marinus, ſeu echinodermata, is divided into 3 ſections, viz. 1. Anocyſti. 2. Catocyſti. 3. Pleurocyſti.

Sect. 1. contains 2 claſſes, viz. 1. Cidaris, 9 genera. 2. Clipeus, 1 genus.

Sect. 2. is compoſed of four claſſes. viz. 1. Fibula, 2 genera. 2. Claſſis, 2 genera. 3. Scutum, 2 genera. 4. Placenta, 3 genera.

Sect. III. conſiſts of 3 claſſes, viz. 1 Arachnoides, 1 genus. 2. Cor marinum, 2 genera. 3. Ovum marinum, 2 genera.

Part VI. Tubulus marinus is compoſed of 11 genera.

In the ſyſtems of Conchology which we have now exhibited, the characters are taken from the ſhells. In the three following, the marks of diſcrimination are derived from the animal as well as from the ſhell. The firſt by M. Adanſon was publiſhed in 1757.

11 Of Adanſon.

SYSTEM of ADANSON

This ſyſtem conſiſts of 3 claſſes, viz. 1 Limaçons. 2. Les conques. 3. Les conques multivales

Class I Limaçons. Sect. I. Limaçons univalves. Sect. II. Limaçons operculés.

Sect. I. Famille. 1. Les limaçons univalves qui n'ont ni yeux ni cornes. Gen. 1. La gondole, *cymbium*. Famille 2. Les limaçons univalves qui ont deux cornes, et les yeux places à leur racine et ſur leur côte interne. Gen. 2. Le bulin, *bulinus*. Gen. 3. Le coret, *coretus*. Gen. 4. Le pietin, *pedipes*. Famille 3. Les limaçons univalves qui ont quatres cornes, dont les deux exterieures portent les yeux ſur leur ſommet. Gen. 5. Le limaçon, *cochlea*. Gen. 6. L'ormier, *haliotis*. Famille 4. Les limaçons univalves qui ont deux cornes, et les yeux placés à leurs racines, et ſur le côte externe, ou par derriere. Gen. 7. Le lepas, *lepas*. Gen. 8. L'yet *yetus*. Gen. 9. La vis, *terebra*. Famille 5. Les limaçons univalves qui ont deux cornes et les yeux posés un peu au-deſſus de leur racine, et ſur leur côte externe. Gen. 10. La porcellaine, *porcellana*. Gen. 11. Le pucelage, *cypræa*. Gen. 12. Le mantelet, *peribolus*.

Sect. 2. Famille 1. Limaçons operculés qui ont deux cornes, avec un renflement, et qui portent les yeux ordinairement au-deſſus de leur racine, et à leur côté externe. Gen. 1. Le rouleau, *ſtrombus*. Gen. 2. La pourpre, *purpura*. Gen. 3. Le buccin, *buccinum*. Gen. 4. Le cerite, *cerithium*. Famille 2. Limaçons opercules, qui ont deux cornes ſans renflement, et les yeux places à leur racine, et ſur leur côte externe. Gen. 5. Le vermet, *vermetus*. Gen. 6. La toupie, *trochus*. Gen. 7. La natice, *natica*. Famille 3. Les limaçons operculés, qui ont quatre cornes, dont les deux exterieures portent les yeux ſur leur ſommet. Gen. 8. Le ſabot, *turbo*. Gen. 9. La nerite, *nerita*.

Class II. Les conques. Sect. I. Les conques bivalves. Famille 1. Les conques bivalves, qui ont les deux lobes du manteau ſeparés, dans tout leur contour. Gen. 1. L'huitre, *oſterum*. Famille. 2. Les conques bivalves dont les deux lobes du manteau forment trois ouvertures ſans aucun tuyau. Gen. 2 Le jataron, *jataronus*. Gen. 3. Le jambonneau, *perna*. Famille 3. Les conques bivalves dont les deux lobes du manteau forment trois ouvertures dont deux prennent la figure d'un tuyau aſſez long. Gen. 4 La came, *chama*. Gen 5. La telline, *tellina*. Gen. 6. Le pectoncle, *pectunculus*. Gen. 7. Le ſolen, *ſolen*.

Class III. Les conques multivalves. Famille 1. Les conques multivalves, dont aucune des pieces de la coquille ne prend la forme d'un tuyau Gen. 1. La pholade. *pholas*. Famille 2. Les conques multivalves, dont une des pieces de la coquille prend la forme d'un tuyau qui enveloppe entierement toutes les autres. Gen 2 Le taret, *teredo*.

12 Of Geoffroy.

VIII. The method of Geoffroy, formed on ſimilar principles with the laſt, was publiſhed at Paris in 1707, in a work entitled "A Summary Treatiſe on the teſtaceous Animals found in the vicinity of Paris." The following is a view of this method.

SYSTEM of GEOFFROY.

Sect. I Coquilles univalves.

Gen. 1. Le limax, *cochlea* Quatre tentacules, dont deux plus grands portent des yeux à leur extremité. Coquille univalve en ſpirale.

Gen. 2. Le buccin, *buccinum*. Deux tentacules plats en formes d'oreilles. Les yeux placés à la baſe des tentacules du côté interieur. Coquille univalve en ſpirale et conique.

Gen. 3. Planorbe, *planorbis*. Deux tentacules filiformes. Les yeux placés à la baſe des tentacules du côté interieur. Coquille univalve en ſpirale, et ordinairement applatie.

Gen. 4. La nerite, *nerita*. Deux tentacules. Les yeux placés à la baſe des tentacules du côté exterieur. Opercule à la coquille. Coquille univalve en ſpirale et preſque conique.

Gen. 5. Ancile, *ancylus*. Deux tentacules. Les yeux placés à la baſe des tentacules du côté inferieur. Coquille univalve concave et unie.

Sect. II. Coquilles univalves.

Gen. 1. La came, *chama*. Deux ſiphons ſimples et alongées. Charniere de la coquille dentelle. Coquille arrondée.

Gen. 2. La moule, *mytilus*. Deux ſiphons courts et frangés. Charniere de la coquille membraneuſe et ſans dents. Coquille alongée.

13 Of Muller. IX. The ſyſtem of Muller firſt publiſhed in 1773, and afterwards extended in a different work which appeared in 1776, arranges teſtaceous animals into three families. The following is a view of this arrangement taken from the latter work on the zoology of Denmark and Norway.

SYSTEM of MULLER.

Familia I. *Teſtacea Univalvia.*

Sect. I. Teſtacea univalvia, teſta pervia.

Gen. 1. *Echinus*. Teſta cruſtacea, ano verticali, tentaculis ſimplicibus.

Gen. 2. *Spatagus*. Teſta cruſtacea, ano infero, tentaculis penicillatis.

Gen. 3. *Dentalium*. Teſta calcarea, teſta rudi, tentaculis nullis.

Sect. II. Teſtacea univalvia, teſta patula.

Gen 4. *Akera*. Apertura effuſa, tentaculis nullis.

Gen. 5. *Argonauta*. Apertura profunda, tentaculis binis.

Gen. 6. *Bulla*. Apertura repanda, tentaculis binis ſetaceis, colliculo extrinſecus oculatis.

Gen. 7. *Buccinum*. Apertura ovata, tentaculis binis triangularibus, angulo intrinſeco oculatis.

Gen. 8. *Carychium*. Apertura ovata, tentaculis binis truncatis conſpicuis, angulo intrinſeco oculatis.

Gen. 9. *Vertigo*. Apertura ſubquadrata, tentaculis binis ſublinearibus, apice oculatis.

Gen. 10. *Turbo*. Apertura orbiculari, tentaculis binis ſetaceis, conſpicuis, angulo extrinſeco oculatis.

Gen. 11. *Helix*. Apertura lunari, tentaculis quatuor linearibus, apice oculatis.

Gen. 12. *Planorbis*. Apertura ſemilunari, tentaculis binis ſetaceis, angulo intrinſeco oculatis.

Gen. 13. *Ancylus*. Apertura totali tentaculis binis truncatis, occultis, angulo extrinſeco oculatis.

Gen. 14. *Patella*. Apertura totali, tentaculis binis ſetaceis, occulto angulo, extrinſeco oculatis.

Gen. 15. *Haliotis*. Apertura repanda, poris pertuſa.

Sect. III. Teſtacea univalvia, teſta operculata.

Gen. 16. *Tritonium*. Libera, apertura canaliculata, tentaculis duobus linearibus, angulo extrinſeco oculatis.

Gen. 17. *Trochus*. Libera, apertura ſub-tetragona, tentaculis duobus ſetaceis, colliculo extrinſeco oculatis.

Gen. 18. *Nerita*. Libera, apertura lunari, tentaculis duobus ſetaceis, angulo extrinſeco oculatis.

Gen. 19. *Valvata*. Libera, apertura circinnata, tentaculis duobus ſetaceis, angulo poſtico oculatis.

Gen. 20. *Serpula*. Adnata, apertura orbiculari, tentaculis pinnatis.

Familia II. *Teſtacea Bivalvia.*

Sect. I. Teſtacea bivalvia cardine dentata.

Gen. 1. *Mya*. Teſta altera extremitate hiante; cardine dente craſſo ſolitario.

Gen. 2. *Solen*. Teſta utraque extremitate hiante; cardine dente reflexo, ſæpe gemino.

Gen. 3. *Tellina*. Siphone duplici murico; cardine dentibus utrinque tribus alternis.

Gen. 4. *Cardium*. Siphone duplici, cirrato, pedeque falciformi; cardine dentibus mediis alternis, remotis penetralibus.

Gen. 5. *Venus*. Siphone duplici, cirrata, pedeque laminæformi; cardine dentibus tribus approximatis, lateralibus divergentibus.

Gen. 6. *Mactra*. Cardine dente medio complicato, adjacente foveola.

Gen. 7. *Donax*. Cardine dentibus duobus, lateralique ſolitario.

Gen. 8. *Arca*. Cardine dentibus numeroſis, alternis, penetrantibus.

Gen. 9. *Terebratula*. Branchiis circinnatis; cardine dentibus alterius uncinatis, valvula ſuperiore deorſum perforata.

Sect. II. Teſtacea bivalvia, cardine edentulo.

Gen. 10. *Anomia*. Branchiis ſimplicibus; valvula inferiore perforata.

Gen. 11. *Oſtrea*. Branchiis ſimplicibus, pede nullo; cardines foſſula cava.

Gen. 12. *Pecten*. Branchiis cirratis, pede juxta auriculam cardine foſſula ovata, byſſum emittens.

Gen. 13. *Mytilus*. Siphone duplici brevi; foſſula lineari, byſſum emittens.

Familia III. *Teſtacea Multivalvia.*

Gen. 1. *Chiton*. Valvulæ dorſales, tentacula nulla.

Gen. 2. *Lepas*. Valvulæ erectæ, tentacula bipartita.

Gen. 3. *Pholas*. Valvulæ ad cardinem minores.

14 Da Coſta. X. To this account of the different methods of arranging ſhells, we ſhall only add the ſyſtem propoſed by Da Coſta in his Elements of Conchology. In this ſyſtem the author adopts the uſual general diviſion into Univalves, Bivalves, and Multivalves.

I. Univalves are diſtributed into 16 families which are divided into four orders.

Order I. Simple; conſiſts of four families. 1. Patella. 2. Haliotis. 3. Vermiculi. 4. Dentalia. Order II. includes only one family. 5. Polythalamia. Order III. Revolved. Fam. 6. Turbinata involuta. Order IV. Turbinated

binated. Fam. 7. Cymbium. Fam. 8. Auris cochlea. 9. Cylindri. Fam. 10. Voluta. Fam. 11. Globoſa. Fam. 12. Caſſides. Fam. 13. Trochi. Fam. 14. Cochleæ. Fam. 15. Buccina. Fam. 16. Murex.

II. Bivalves compoſed of 3 orders.

Order I. With unequal valves, and ſhut cloſe, Fam. 1. Pecten. Fam. 2. Spondylus. Fam. 3. Oſtreum. Fam. 4. Anomia. Ord. II. With equal valves. and ſhut cloſe, is divided into three ſections. Sect. 1. Multarticulate. Fam. 5. Pectinoides. Fam. 6. Pectunculi. Fam. 7. Arca. Sect. 2. Articulate. Fam. 8. Pectunculus. Fam. 9. Tellina. Fam. 10. Placenta. Sect. 3. Inarticulate. Fam. 11. Margaritifera. Fam. 12. Muſculus. Ord. III. With valves that never ſhut cloſe. Fam. 13. Chama, *Gapers*.

III. Multivalves contains one order. Fam. 14. Pholas. Fam. 15. Anatiferæ. Fam. 16. Balani.

CHAP II. OF THE ANIMALS WHICH INHABIT SHELLS.

15 Generic characters of teſtaceous animals. BEFORE we proceed to the claſſification of ſhells, we ſhall here give a ſhort deſcription of the animals which inhabit them. Of theſe, however, a minute and accurate anatomical deſcription is not to be expected; for little more is known of the ſtructure of theſe animals than what has been given by naturaliſts concerning their external characters.

Some of the animals, which inhabit ſhells, are alſo found in the *molluſca* ſtate; that is without any teſtaceous covering. Such, for inſtance, is the *limax*, or ſnail.

The animals which have been found inhabiting ſhells are the following; viz. Doris, Triton, Aſcidia, Tethys, Limax, Spio, Amphitrite, Terebella, Nereis.

Doris.—The body is creeping, oblong, and flat beneath; the mouth is placed below, on the forepart; vent behind on the back, and ſurrounded by a fringe. Feelers two or four ſituated on the upper part of the body in front, and retractile within their proper receptacles.

The animal which inhabits the chiton belongs to this genus.

Triton.—The body is oblong, and the mouth is furniſhed with an involute ſpiral proboſcis: tentacula or arms 12, ſix on each ſide, divided nearly to the baſe. The hind ones cheliforous.

The triton inhabits different ſpecies of lepas.

Aſcidia. The body is fixed, roundiſh, and apparently iſſuing from a ſheath; apertures two, generally placed near the upper end, one beneath the other. The animals are found in the ſea, and adhere by their baſe to rocks, ſhells, and other ſubmarine ſubſtances: they are more or leſs gelatinous. The only powers of motion which they poſſeſs ſeem to be that of contracting and dilating themſelves alternately; by which means they are enabled to throw out the water which they take in with conſiderable force.

This animal inhabits the pholas, ſolen, ſome ſpecies of the mya, mactra, and other bivalves.

Tethys.—The body is detached, rather oblong, fleſhy, without peduncles: the mouth is furniſhed with a terminal cylindrical proboſcis, under an expanded membrane or lip: apertures two, on the left ſide of the neck.

The tethys inhabits a great proportion of bivalve ſhells, as many ſpecies of tellina, cardium, mactra, venus, oſtrea, and others.

Limax.—The body is oblong, creeping, with a fleſhy kind of ſhield above, and a longitudinal flat diſc beneath: aperture placed on the right ſide within the ſhield: feelers 4, ſituated above the mouth, with an eye at the tip of each of the larger ones.

The animals belonging to this genus inhabit the turbinated univalve ſhells; but it appears that all the animals which inhabit theſe ſhells do not exactly correſpond with the above generic characters.

Spio.—The body projecting from a tube, jointed and furniſhed with dorſal fibres; peduncles or feet rough with briſtles, and placed towards the back; feelers 2; long, ſimple; eyes 2; long.

This animal inhabits ſome ſpecies of ſabella.

Amphitrite.—Body projecting from a tube, and annulate; peduncles or feet ſmall, numerous, with lateral faſciculi, and branchiæ; feelers 2, approximate, feathered; no eyes.

The amphitrite inhabits ſome ſpecies of ſabella and ſerpula.

Terebella.—Body oblong, creeping, naked, furniſhed with lateral faſciculi, or tufts, and branchiæ; mouth placed before, furniſhed with lips, without teeth, and protruding a clavated proboſcis; feelers numerous, ciliated, capillary, and placed round the mouth.

This animal is an inhabitant of many ſpecies of dentalium, ſerpula and ſabella.

Nereis.—Body long, creeping, with numerous lateral peduncles or feet on each ſide; feelers ſimple, rarely none; eyes 2 or 4, rarely none. According to ſome naturaliſts, the nereis inhabits ſome ſpecies of ſabella.

Sepia.—Body fleſhy, receiving the breaſt in a ſheath, with a tubular aperture at its baſe; arms 8, beſet with numerous warts or ſuckers, and in moſt ſpecies 2 pedunculated tentacula; head ſhort; eyes large; mouth reſembling a parrot's beak.

The animal which inhabits the argonauta is conſidered by naturaliſts as belonging to this genus.

Clio.—Body oblong, natant, generally ſheathed and furniſhed with two dilated membranaceous arms or wing-like proceſſes; tentacula 3, beſides 2 in the mouth.

According to ſome naturaliſts, it is an animal belonging to this genus, which inhabits the argonauta.

CHAP. III. OF THE TERMS WHICH ARE EMPLOYED IN DESCRIBING SHELLS.

16 Terms explained. AS it will tend to facilitate our progreſs in the ſtudy of *Conchology*, clearly to underſtand the terms which are employed in deſcribing ſhells, and the names by which the different parts have been diſtinguiſhed by naturaliſts; we ſhall here give a few definitions of the principal terms. And that theſe definitions may be eaſily conſulted, we ſhall obſerve the ſame order as in the claſſification which is to be adopted. They may be conveniently arranged, therefore, into the three diviſions of multivalves, bivalves, and univalves.

1. *Explanation of the Terms of Multivalve Shells*

17 Multivalves. Multivalve ſhells are compoſed of more than two pieces.

Articulated (teſtæ articulatæ), when the different pieces of which the ſhell is compoſed are ſo ſtrongly united that they ſeem to form one ſhell.

Æquivalve ſhells (teſtæ æquivalves), when the valves of the two ſides have the ſame form, ſize, and poſition.

A ſhell is ſaid to *adhere* (teſta adherens,) when it is attached to ſolid bodies by ſome of the pieces of which it is compoſed: It is ſaid to be *looſe* (teſta libera), when it is not attached by any point.

Pedunculated (teſta pedunculata), when all the pieces of which it is compoſed, are ſupported by a tendinous peduncle which is fixed to ſolid bodies.

Tubular (teſta tuboloſa,) when the greateſt part of the ſhell is formed of a cylindrical tube.

Baſe of the ſhell (baſis teſtæ), that part on which it is ſupported.

Ligament (ligamentum), is a membranous or tendinous ſubſtance which connects the valves together, and ſometimes lines the cavity of the ſhells. Of this there are ſeveral varieties.

——— ſcaly (ligamentum ſquamatum), when the ſurface is covered with ſmall granular ſcales.

———prickly (ligamentum aculeatum), when the ſurface is furniſhed with ſmall rough points.

——— ſmooth (ligamentum læve), when the ſurface has neither points, ſcales, nor tubercles.

——— punctated (ligamentum punctatum), when the ſurface is marked with ſmall cavities.

Lid (operculum), is the name given to four ſmall triangular valves articulated in the form of a croſs, which ſhut up the ſuperior orifice of ſome ſpecies of multivalve ſhells.

Peduncle (pedunculus) is the tedinous ſubſtance which ſupports ſome of the multivalve ſhells. It is flexible while the animal is alive, and is ſmooth or ſcaly

Rays (radii); theſe are impreſſions on the external ſurface of ſome ſhells; they are of a conical form, having the vertex turned towards the baſe of the ſhell. They are only diſtinctly ſeen in adult ſhells.

———filiform (radii filiformes) are long and narrow.

——— ſmooth (radii leves.)———

——— ſtriated (radii tranſverſim ſtriati.)———

Valves (valvulæ) are the different pieces of which multivalve ſhells are compoſed.

2. *Explanation of the Terms applied to Bivalve Shells.*

A bivalve ſhell is ſaid to *adhere* (teſta adherens), when it is fixed by any part of one of its valves to a ſolid body. 18 Bivalves.

It is ſaid to have *ears* (teſta aurita), when it forms at its baſe, one or two compreſſed angles.

Gaping (teſta hians), when the valves do not ſhut cloſe.

Bearded (teſta barbata), covered externally with an epidermis compoſed of ſtrong hair or briſtles.

Compreſſed (teſta compreſſa), when the valves are flat, forming a ſmall cavity.

Heart-ſhaped (teſta cordata), having the form of a heart; (ſubcordata) approaching to that form.

Toothleſs (edentula), without teeth at the hinge.

Equilateral (teſta æquilatera), when the anterior and poſterior part of the ſhell is equal in form and figure.

Equivalve (equivalvis), when the two valves are ſimilar in form and convexity.

Irregular (teſta irregularis), when the form varies in the individuals of the ſpecies.

Lenticular (lenticularis), when the valves are round, and little elevated in the middle, and diminiſh gradually in thickneſs towards the edges.

Linear (teſta linearis), when the length conſiderably exceeds the breadth, but without a cylindrical form.

Tongue-ſhaped (linguæformis), flat and oblong, having the two extremities round and obtuſe.

Boat-ſhaped (navicularis), reſembling the figure of a boat.

Pectinated (pectinata), when the valves being furniſhed with longitudinal ribs, have on their anterior ſurface ribs nearly tranſverſe which form by their union with the firſt acute angles.

Radiated (radiata), when it is marked on the external ſurface with rays, ribs, or elevated ſtriæ, which proceed from the extremity of the ſummits, and terminate in the circumference of the valves.

Beaked (roſtrata), when one of its ſurfaces, either anterior or poſterior, being contracted and elongated, terminates in form of a beak.

Baſe (baſis). The ſituation in which Linnæus has deſcribed and conſidered bivalve ſhells, conſiſts in placing the beaks of the ſhell turned downwards, in ſuch a way that the ligamens of the valves may be ſeen, ſo that the baſe of the ſhell is the region of its beaks.

Margin of the ſhell (margo teſtæ) ſignifies the whole circumference of the ſhell, parallel to the edge of the valves. It is divided into anterior, poſterior, and ſuperior.

——— anterior (margo anterior), when the ſhell is placed on the beak of the valves, commences at the ſide of the ligament, on the fore-part of the beaks,

Terms employed in deſcribing Shells.

mits, and extends to one third of the whole circumference of the valves,

Margin poſterior (margo poſterior), extends to one-third of the circumference from the beaks of the valves behind.

——— ſuperior (margo ſuperior), includes the upper part of the circumference of the valves comprehended between the ſuperior extremity of the anterior margin, and the ſuperior extremity of the poſterior margin. Hence the whole circumference of the ſhell is divided into 3 equal parts.

Margins of the valves (margines valvularum), ſignify the whole interior circumference of the valves, including about the breadth of a line of the outer edge. They are divided into

——— furrowed (margines canaliculati), having on ſome part of the anterior circumference, a ſmall gutter parallel to it.

——— notched (margines crenulati), furniſhed interiorly with rounded notches.

——— toothed (margines dentati), provided with pointed teeth.

——— folded (margines plicati), furniſhed with folds which reciprocally correſpond with thoſe of the oppoſite valve.

——— ſimple (margines ſimplices) having neither folds, teeth, nor notches.

——— ſtriated (margines ſtriati), having longitudinal ſtriæ.

Hinge. The hinge of a ſhell is the moſt ſolid and thickeſt part of the circumference of the valves, conſtituting their baſe. It is almoſt always furniſhed with teeth of different proportions, which ſerve to fix the valves together. The hinge is

——— compreſſed (cardo depreſſus), formed of one compreſſed tooth.

——— lateral (cardo lateralis), when it is placed at one of the ſides of the ſhell.

——— oblong (cardo oblongus), when it occupies the whole baſe of the ſhell.

——— reflected (cardo reflexus), when its edges are folded back externally towards the convexity of the valves.

——— terminal (cardo terminalis), ſituated at the inferior extremity of the ſhell.

——— truncated (cardo truncatus), when the baſe of the ſhell terminates tranſverſely and ſuddenly, and the teeth of the hinge are fixed in this part.

Teeth (dentes), are ſolid protuberances, commonly pointed, with which the hinge of ſhells is uſually furniſhed, and which are deſtined to fix the two valves together. They are divided into

——— alternate (dentes alternati), when they are placed in a line parallel to the edges of the hinge; and when the teeth of one valve are received into the interſtices of the teeth of the other valve.

——— articulated (dens inſertus), when it is received in a correſponding cavity at the oppoſite valve.

——— forked (dens duplicatis ſeu bifidus), having the point divided into two

——— cardinal (dens primarius ſeu cardinalis), is the tooth which is placed immediately oppoſite.

——— compreſſed (dens depreſſus), which is very much flattened.

Teeth erect (dens erectus), when the valve is laid on the convex ſide, the tooth riſes perpendicularly.

——— longitudinal (dens longitudinalis), when it extends like a rib on the baſe of the valves.

The *diſk* (diſcus), ſignifies the convex centre of the valves, which is uſually ſituated between the belly of the ſhell and its limb.

Limb (limbus), is the circumference of the valves from the diſk to their edges.

Belly of the ſhell (teſtæ umbo), is the moſt inflated part of the valves.

It is vaulted (umbo fornicatus) when in the interior of the valves it exhibits a cavity ſeparated from the hinge by a vertical membrane.

Nates are two protuberances of a conical figure, ſomewhat ſpiral, which accompany the external baſe of moſt bivalve ſhells. They are

——— flattened (nates depreſſæ), when the ſurface is ſenſibly compreſſed.

——— approximate (nates approximatæ), meeting together when the ſhell is ſhut.

——— horned (nates corniformes), when the angles being conſiderable, and their direction waved or ſpiral, they reſemble a horn.

——— bent (nates incurvatæ), when the curvature of the one is directed towards that of the other.

——— ſeparated (nates diſtantes), when they are ſeperated from each other, at leaſt the diſtance of a line.

——— diſtant (nates remotiſſimæ), when the interval is very great.

——— reflected (nates recurvæ), when the curvature is directed towards the poſterior ſurface of the ſhell.

——— wrinkled (nates rugoſæ), when the ſurface is marked with unequal lines.

——— ſpiral (nates ſpirales), when the curvature exhibits more than one circumvolution.

Vulva, is ſituated at the lower part of the anterior margin of the valves. It is divided into

——— hollowed (excifa, ſeu canaliculata), when it is marked with a groove during its whole length.

——— diſtinct (diſtincta, marked by a perceptible difference of colour.

——— lettered (ſcripta ſeu literata), when the ſurface is marked with lines reſembling written characters.

——— inflected (inflexa), when the edge of the lips is bent towards the inner ſurface of the valves.

Anus, is an impreſſion uſually hollow, placed at the lower part of the poſterior ſurface. It is divided into

——— bordered (marginatus), when it is circumſcribed by a diſtinct elevation.

——— heart-ſhaped (cordatus), exhibiting the form of a heart.

——— toothed (dentatus), furniſhed with teeth or notches.

——— lanceolated (lanceolatus), when the length is greater than the breadth, and the extremities are pointed.

——— open (patulus ſeu hians), forming by the ſeparation of its edges, a conſiderable opening, which penetrates into the interior of the ſhell.

——— oval (ovatus), of an elliptical figure.

Valves,

Terms employed in deſcribing Shells.

Valves, of bivalve ſhells, are divided into right and left, equal and unequal, equilateral and inequilateral, ſuperior and inferior.

——— right valve (dextra), is diſtinguiſhed from the left, by placing the ſhell on its baſe, having the cardinal ligament before, and the anus behind. In this poſition the right valve of the ſhell correſponds to the left of the obſerver, and the left valve (ſiniſtra) to the right of the obſerver.

——— equal (equales), when the right valve correſponds with the left in form, ſize, and other external characters.

——— ſuperior (valvula ſuperior). In an irregular ſhell, ſuch as the oyſter, one of the valves is attached to ſolid bodies; the other in this caſe is ſuperior. This valve is ſometimes called by Linnæus, the lid (operculum): in ſome ſpecies it is flat and ſmall, and in others more convex than the inferior valve.

——— keel-ſhaped (valvulæ carinatæ), when one part of their convexity preſents a ſharp edge.

——— chambered (concameratæ), when they exhibit in their cavity teſtaceous plates, detached and raiſed.

——— ſpinous (ſpinoſæ), when the whole ſurface is furniſhed with ſpines.

——— banded (faſciatæ), exhibiting large coloured tranſveſe ſtripes or bands.

——— lamellated (lamelloſæ), when the ſurface is furniſhed with plates more or leſs ſeparated.

——— radiated (radiatæ), exhibiting divergent or coloured rays.

——— ſinuated (lacunoſæ), when one of the valves has a ſenſible depreſſion at the middle of its margin, and a correſponding elevation of the oppoſite valve.

——— ſtriated (ſtriatæ) when the ſurface is marked with ſtriæ.

——— tranſverſe, when the ſtriæ are parallel to the margin of the valves.

——— longitudinal, when they run from the baſe to the circumference.

Muſcular impreſſions (impreſſiones), are marks on the interior ſurface of the valves, where the muſcles of the animal are attached.

——— ſolitary (ſolitariæ), when the inner ſurface of each valve has only one.

——— double (duplicatæ), two on the inner ſurface of each valve.

——— triple or ternate (ternatæ), three in each valve.

Ligament (ligamentum), is a horny ſubſtance, of little flexibility, which unites the two valves near their baſe, and which in almoſt all bivalve ſhells is placed at the lower part of their anterior ſurface. It is divided into.

——— gaping (hians), when its upper extremity is divided into two.

——— double (duplex), when under the external ligament there appears a ſecond, in a particular hollow of the hinge, which does not appear externally.

——— internal (internal), when it unites the valves without appearing externally.

——— profound (retractum ſeu intractum), when it is ſo deep in the ſuture as ſcarcely to be ſeen when the valves are ſhut.

——— truncated (truncatum), when ſhorter than its ſuture.

Furrows (ſulci), are thoſe impreſſions or interſtices between the ribs or rays on the ſurface of the valves.

——— ſquare (quadrati), when the bottom is flat.

——— lamellated (lamelloſi), when the bottom is marked with ſmall tranſverſe ſcales.

——— punctated (excavato punctati), when the whole ſurface is marked with ſmall cavities or dots.

3. *Explanation of Terms applied to Univalve Shells.*

19 Univalves.

The *baſe*, (baſis) is the moſt elevated part of the ſhell, oppoſite to the ſpire. It is divided into

——— notched (emarginata), when it is accompanied with a deep notch.

——— tubular (tubuloſa ſeu cordata), when it is formed by a tube.

——— ſimple or entire (ſimplex aut integra), without notch or tube.

Summit (vertex) ſignifies the top of ſome patellæ, and from its poſition is central marginal, or ſubmarginal.

The *ſhell* (teſta) is divided with regard to its poſition into ſuperior and inferior.

The *anterior part* (pars antica), is that which forms the ſpire of the ſhell; and it is alſo the ſuperior part.

The form of ſhells is

——— bordered (marginata), when the two ſides of the opening are broader and thicker then the reſt of the diameter.

——— chambered (polythalamia), when it is internally divided by different partitions parallel to the opening.

——— convoluted (convoluta), when the ſpires turn round a lengthened cone, nearly vertical to each other.

——— rooted (radicata), when it is attached to a ſolid body by a ligament proceeding from its baſe.

——— interrupted (interrupta), when the ſucceſſive additions to the ſhell are marked with diſtinct rings.

——— umbilicated (umbilicata), when the axis round which the ſphere turns, being empty, forms a cavity at the baſe of the ſhell, whoſe diameter is at leaſt a ſixth part of that of the ſhell.

——— imperforated (imperforata ſeu exumbilicata), when its inferior axis has neither hole nor umbilicus.

——— oval or elliptic (ovales), the longitudinal diameter exceeding the tranſverſe, and the two extremities equal and a little contracted.

——— egg-ſhapped (ovata), the longitudinal diameter exceeding the tranſverſe, and the extremities terminated by the ſegment of a circle.

——— beaked (roſtrata), when the two extremities, ſometimes tubular, form a projection in form of a beak.

——— imbricated (imbricata), when the ſurface is covered with parallel ſcales, ſo arranged as to cover each other.

——— turbinated (turbinata), when the belly of the ſhell is large in proportion to the ſpires, which ſeem to proceed from its center.

Terms employed in deſcribing Shells.

Opening or *mouth* (apertura), is that part of the cavity of the ſhell which is viſible. It is

——— angular (angulata), when its circumference has ſeveral angles.

——— gaping (dehiſcens), when one of the extremities is wider than the other.

——— bimarginated (bimarginata), when the right lip forms a double margin

——— compreſſed (coarctata), when it is diſtinctly flattened.

——— ſemicircular (ſemiorbiculata), when it forms half a circle.

——— linear (linearis), when it is narrow, and the length conſiderably exceeds the breadth.

——— longitudinal (longitudinalis,) when the length is greater than the breadth, and the greateſt dimenſion is parallel to the axis of the ſhell.

——— orbicular (orbicularis), forming an entire circle.

——— ſtriated (ſtriata), when the cavity is marked with ſtriæ, parallel to the direction of the convolutions.

——— tranſverſe (tranſverſa), when the breadth is greater than the length.

Pillar (columella), is that part of the ſhell ſituated within the opening, near its axis, round which the ſpires turn. It is brought into view by dividing the ſhell its whole length. It is

——— flattened (plana), when the ſurface is flat and ſmooth.

——— caudated (caudata), when it is lengthened beyond the baſe of the ſhell.

——— folded (plicata), marked with tranſverſe and diſtinct folds.

——— ſpiral (ſpiralis), proceeding from the baſe, and forming a ſmall twiſted elongation.

——— truncated (truncata), cut tranſverſely at the baſe.

Convolutions (anfractus), are the turnings of the ſpire round the pillar, from the opening to the baſe of the ſhell. They are

——— bifid (bifidi), when each is divided into two equal parts by a furrow or ſpiral line.

——— grooved (canaliculati), when the ſuperior edge is marked with a groove.

——— keel-ſhaped (carinati), when the outer turn of the ſhell is marked with an angle more or leſs acute.

——— crowned (coronati), when the upper ſurface is bordered at a little diſtance from the ſutures, with a ſingle row of tubercles or ſpinous ſcales.

——— dextral (dextri), turning from the left to the right.

——— ſiniſtral (ſiniſtri), turning from the right to the left.

——— lettered (ſcripti), marked with characters.

——— ſpinous (ſpinoſi), having ſhort ſpines on the ſurface.

——— entire (ſimplices), without furrows or tubercles.

——— banded (faſciati), when the ſurface is marked with broad coloured ſtripes.

——— lamellated (lamellati), the ſurface marked with longitudinal or tranſverſe excreſcences, and laminated like membranes.

Terms employed in deſcribing Shells.

——— lineated (lineati), marked with coloured lines.

——— radiated (ſpinoſo-radiati), having the circumference bordered with ſtraight ſpines, ſeparating and divergent.

——— ſeparated (disjuncti), having an interval between each convolution.

——— furrowed (ſulcati), having the ſurface marked with furrows, which are always broader than ſtriæ.

——— decuſſated (decuſſati), when the ſtriæ croſs each other at right angles.

Spire (ſpira), ſignifies all the convolutions taken together. It is

——— pointed (acuta), when the convolutions joined together form an acute angle.

——— flattened (depreſſa), forming a flat ſurface.

——— convex (convexa), when it is rounded, and the point of the baſe has little elevation.

——— convex (convexo-acuta), rounded at the outer edge, but elevated into an acute angle.

——— convex and elevated (convexo-exſerta), rounded at the outer edge, and elevated without forming an acute angle.

——— convex and pointed (convexo-mucronata), obtuſe and almoſt rounded at the outer edge, and terminated at the centre with a pointed elevation.

——— crowned (coronata), when the outer edges of each convolution are accompanied with a row of ſpines or tubercles.

——— capitate (capitata), the convolutions united, forming a ſwelling reſembling a head.

——— obtuſe (obtuſa,) the convolutions united, forming an obtuſe angle.

——— plano concave (plano-concava), the convolutions forming no elevation, but are ſlightly grooved.

——— pyramidal (pyramidata), of a conical form.

Sutures (ſuturæ), ſignify the place of junction of the different convolutions, forming a ſpiral line. They are

——— grooved (canaliculatæ), when they are ſo deep as to form a ſmall canal.

——— notched (crenulatæ), when the points of contact are marked with notches.

——— double (duplicatæ), accompanied with two ſtriæ, which run parallel.

——— effaced (obſoletæ), when the place of junction is not perceptible.

Siphon (ſipho), is a ſmall canal ſituated in the internal part of the ſhell of the nautili, which penetrates into the diviſions of which it is compoſed. It is

——— central (centralis), when it is ſituated in the middle of the diviſions.

——— lateral (lateralis), ſituated at one ſide.

——— oblique (obliquus), cutting the axis of the diviſions obliquely.

Veins (varices), are elevations or ribs, running in the direction of the length of the ſhell, formed by the junction of the different additions which the ſhell has received. They cut the convolutions of the ſpire tranſverſely. They are

——— continued (continuatæ), proceeding from the baſe of the ſpire to the convolution at the opening, without interruption

——— ſpinous (ſpinoſæ), furniſhed with ſtrong ſpines.

——— interrupted (decuſſatæ), not correſponding with the different convolutions.

CHAP. IV. CLASSIFICATION OF SHELLS.

20 Claſſification. SHELLS are divided by Linnæus into multivalve, bivalve, and univalve. In the following claſſification the ſame arrangement will be adopted; and we ſhall firſt exhibit in one view the characters of each genus, in the original language of Linnæus, with a tranſlation oppoſite, for the ſake of the Engliſh reader; ſo that the genus of any ſhell may be eaſily determined. In deſcribing the ſpecies, we ſhall obſerve the utmoſt brevity, giving ſuch characters only as are neceſſary to afford preciſe marks of diſtinction. In arranging the ſpecies under each genus, the Britiſh ſpecies will be diſtinguiſhed with an aſteriſk; ſo that, with the advantage of a general claſſification, this will anſwer the purpoſe of a Britiſh conchology.

GENERIC CHARACTERS.

I. MULTIVALVE SHELLS.

21 Generic character of multivalves.

1. Chiton. Animal doris. Teſtæ plures, ſecundum longitudinem ſibi appoſitæ dorſo incumbentes.	1. C. Animal inhabiting the ſhell a doris. Shell conſiſting of ſeveral ſegments or valves diſpoſed down the back.
2. Lepas. Animal triton. Teſta baſi affixa multivalvis: valvis inæqualibus erectis.	2. L. Animal a triton. Shell affixed at the baſe, and conſiſting of many unequal erect valves.
3. Pholas. Animal aſcidia. Teſta bivalvis divaricata, cum minoribus acceſſoriis difformibus: cardo recurvatus cartilagine connexus.	3. P. Animal an aſcidia. Shell bivalve, divaricate, differently ſhaped; acceſſory valves: hinges bent back, united by a cartilage: beneath the hinge internally, is an incurved tooth.

II. BIVALVE SHELLS.

22 Of bivalves.

4. Mya. Animal aſcidia. Teſta bivalvis hians, ut plurimum, altera extremitate: cardo dente (pleriſque uno) ſolido, craſſo, patulo, vacuo; nec inſerto teſtæ appoſitæ.	4. M. Animal an aſcidia. Shell bivalve, generally gaping at one end. Hinge with broad, thick, ſtrong teeth (ſeldom more than one), and not inſerted into the oppoſite valve.
5. Solen. Animal aſcidia. Teſta bivalvis oblonga, utroque latere hians. Cardo dens ſubulatus reflexus, ſæpe duplex, non inſertus teſtæ appoſitæ, margo lateralis magis obſoletus.	5. S. Animal an aſcidia. Shell bivalve, oblong, open at both ends. Hinge with a ſubulate, reflected tooth, often double, and not inſerted in the oppoſite valve, the lateral margin more effaced.
6. Tellina. Animal tethys. Teſta bivalvis, anterius hinc ad alterum latus flexa. Cardinis dentes ut plurimum tres: laterales plani alterius teſtæ.	6. T. Animal a tethys. Shell bivalve, generally ſloping on one ſide, in the fore part of one valve a convex, of the othera concave fold. Hinge uſually with three teeth: the lateral ones in one ſhell being ſmooth.
7. Cardium. Animal tethys. Teſta bivalvis ſubæquilatera, æquivalvis plerumque convexa, longitudinaliter coſtata, ſtriata aut ſulcata, margine dentata. Cardo dentibus mediis binis alternatis: altero ut plurimum incurvo; lateralibus remotis inſertis.	7. C. Animal a tethys. Shell bivalve, nearly equilateral, æquivalve, generally convex, longitudinally ribbed, ſtriated or grooved, with a toothed margin. Hinge with two teeth near the beak, and a larger remote lateral one on each ſide, each locking into the oppoſite.
8. Mactra. Animal tethys. Teſta bivalvis, inæquilatera, æquivalvis. Cardo dente medio complicato cum adjecta foveola, lateralibus remotis inſertis.	8. M. Animal a tethys. Shell bivalve, of unequal ſides, and æquivalve. Middle tooth of the hinge complicated, with a ſmall hollow on each ſide, lateral ones remote and inſerted into each other.
9. Donax. Animal tethys. Teſta bivalvis, margine ſæpe crenulato antico obtuſiſſimo. Cardo dentibus duobus; marginalique ſolitario (rarius duplice, triplice, aut nullo) ſubremoto ſub ano.	9. D. Animal a tethys. Shell bivalve, generally with a notched margin; the frontal margin very obtuſe. Hinge with two teeth, and a ſingle marginal one placed behind (rarely double, triple, or none).
10. Venus. Animal tethys. Teſta bivalvis; labiis margine antico incumbentibus. Cardo dentibus tribus, omnibus approximatis, lateralibus apice divergentibus.	10. V. Animal a tethys. Shell bivalve; the frontal margin flattened with incumbent lips. Hinge with three teeth, all approximate; the lateral ones divergent at the tip.

11. Spondylus.

Classification of Shells.

11. Spondylus. Animal tethys. Teſta inæquivalvis rigida. Cardo dentibus duobus recurvis, cum foveola intermedia.

12. Chama. Animal tethys. Teſta bivalvis craſſior, cardo callo gibbo, oblique inſerto foſſulæ obliquæ.

13. Arca. Animal tethys? Teſta bivalvis æquivalvis. Cardo dentibus numeroſis, acutis alternis inſertis.

14. Ostrea. Animal tethys. Teſta bivalvis (plurimis inæquivalvis ſubaurita. Cardo edentulus, foſſula cava, ovata, ſulciſque (in plurimis) lateralibus tranſverſis.

15. Anomia. Animal corpus ligula emarginta ciliata: ciliis valvæ ſuperiori affixis: brachiis duobus linearibus corpore longioribus conniventibus porrectis, valvæ alternis utrinque ciliatis: ciliis affixis valvæ utrique: teſta inæquivalvis, valva altera planiuſcula, altera baſi magis gibba: parum altera baſi ſæpe perforata. Cardo cicatricula lineari prominente introrſum dente laterali; valvæ vero planioris in ipſo margine. Radii duo oſſei pro baſi animalis.

16. Mytilus. Animal aſcidia? Teſta bivalvis, rudis, ſepius affixa byſſo, ut plurimum, craſſiori. Cardo in plurimis edentulus, diſtinctus, paucis exceptis, linea ſubulata, excavata longitudinali.

17. Pinna. Animal limax. Teſta ſub-bivalvis fragilis, erecta hians, emittens barbam byſſinam. Cardo edentulus, coalitis in unam valvis.

11. S. Animal a tethys. Shell hard, ſolid, with unequal valves. Hinge with two recurved teeth, ſeparated by a ſmall cavity.

12. C. Animal a tethys. Shell bivalve rather coarſe. Hinge with a callous protuberance, obliquely inſerted in an oblique hollow.

13. A. Animal a tethys? Shell bivalve equivalve. Hinge with numerous ſharp teeth, alternately inſerted between each other.

14. O. Animal a tethys. Shell bivalve, generally with unequal valves, and ſlightly eared. Hinge without teeth, but furniſhed with an ovate cavity, and in moſt with lateral, tranſverſe furrows.

15. A. Animal an emarginate, ciliated, ſtrap-ſhaped body, with briſtles attached to the upper valve; arms two, linear, longer than the body, projecting and approaching together, alternate on the valve, and ciliated on each ſide, with briſtles affixed to each valve. Shell inequivalve, one of the valves flattiſh, the other protuberant at the baſe: one of the valves often perforated near the baſe. Hinge with a linear prominent cicatrix, and a lateral tooth placed within; but on the very margin of the flat valve there are two bony rays for the baſe of the animal.

16. M. Animal an aſcidia? Shell bivalve, rough, generally affixed by a byſſus or beard of ſilky filaments. Hinge moſtly without teeth, and in moſt caſes with a ſubulate, hollow, longitudinal line.

17. P. Animal a limax. Shell bivalve, brittle, gaping at one end, and having a byſſus or beard. Hinge without teeth, the valves being united into one.

III. UNIVALVE SHELLS.

23 Univalves.

18. Argonauta. Animal ſepia aut clio. Teſta univalvis, ſpiralis, involuta, membranacea, unilocularis.

19. Nautilus. Animal? Teſta univalvis, iſthmis perforatis concamerata, polythalamia.

20. Conus. Animal limax. Teſta univalvis convoluta, turbinata; apertura effuſa, longitundinalis, linearis, edentula, baſi integra; columella levis.

21 Cypræa. Animal limax. Teſta univalvis, involuta, ſub-ovata, obtuſa, lævis. Apertura utrinque effuſa, linearis utrinque dentata longitudinalis.

22 Bulla. Animal limax. Teſta univalvis convoluta, inermis. Apertura ſub-coarctata, oblonga, longitudinalis, baſi integerrima. Columella obliqua, lævis.

23. Voluta. Animal limax. Teſta unilocularis ſpiralis. Apertura ecaudata, ſub-effuſa. Columella plicata: labio umbilicove (ut plurimum) nullo.

24. Buccinum. Animal limax. Teſta univalvis, ſpiralis, gibboſa. Apertura ovata deſinens in canaliculum (retuſam lacunam) dextrum, cauda retuſa. Labium interius explanatum.

25. Strombus. Animal limax. Teſta univalvis, ſpiralis, latere ampliata. Apertura labro ſæpius dilatato, deſinens in canalem ſiniſtrum.

26. Murex. Animal limax. Teſta univalvis, ſpiralis, exaſperata ſuturis membranaceis. Apertura deſi-

18. A. Animal a ſepia or clio. Shell univalve, ſpiral, involute, membranaceous, one cell.

19. N. Animal? Shell univalve, divided into ſeveral chambers communicating with each other.

20. C. Animal a limax. Shell univalve, convolute, turbinate; aperture effuſe, longitudinal, linear, without teeth; entire at the baſe. Pillar ſmooth.

21. C. Animal a ſlug. Shell univalve, involute, ſubovate, ſmooth, obtuſe. Aperture effuſe at each end, linear, extending the whole length of the ſhell, and toothed on each ſide.

22. B. Animal a limax. Shell univalve, convolute, without teeth. Aperture a little narrowed, oblong, longitudinal, quite entire at the baſe. Pillar oblique and ſmooth.

23. V. Animal a limax. Shell one cell, ſpiral. Aperture without a beak, and ſomewhat effuſe. Pillar twiſted or plaited: generally without lips or perforation.

24. B. Animal a limax. Shell univalve, ſpiral, gibbous. Aperture ovate, ending in a ſhort canal, leaning to the right, with a retuſe beak. Internal or pillar lip expanded.

25. S. Animal a limax. Shell univalve, ſpiral, enlarged at the ſide. Aperture dilated with the lip expanding, and ending in a groove towards the left.

26. M. Animal a limax Shell univalve, ſpiral, rough, with membranceous ſutures. Aperture oval,

nens in canalem integrum rectum ſive ſubaſcendentem.

27. Trochus. Animal limax. Teſta univalvis ſpiralis, ſubconica. Apertura ſubtetragono-angulata ſeu rotundata, ſuperius tranſverſe coarctata; columella obliquata.

28. Turbo. Animal limax. Teſta univalvis, ſpiralis, ſolida. Apertura coarctata, orbiculata, integra.

29. Helix. Animal limax. Teſta univalvis, ſpiralis, ſubdiaphana, fragilis. Apertura coarctata, intus lunata ſeu ſubrotunda; ſegmento circuli dempto.

30. Nerita. Animal limax. Teſta univalvis, ſpiralis, gibba, ſubtus planiuſcula. Apertura ſemiorbicularis, vel ſemilunaris; labio columellæ tranſverſo, truncato, planiuſculo.

31. Haliotis. Animal limax. Teſta auriformis, patens: ſpira occultata laterali diſco, longitudinaliter poris pertuſa.

32. Patella. Animal limax. Teſta univalvis ſubconica, abſque ſpira.

33. Dentalium. Animal terebella. Teſta tubuloſa, recta, monothalamia, utraque extremitate pervia.

34. Serpula. Animal terebella. Teſta univalvis, tubuloſa, adherens (ſæpe iſthmis integris paſſim intercepta).

35. Teredo. Animal terebella. Valvis duabus calcariis hemiſphericis, anterius exciſis, et duabus lanceolatis. Teſta teres, flexioſa, lignum penetrans.

36. Sabella. Animal nereis. Ore ringente tentaculis duobus craſſioribus pone caput. Teſta tubuloſa, contexta ex arenulis confertim membranæ vaginali inſertis.

terminating in an entire ſtraight, or ſlightly aſcending canal.

27. T. Animal a limax. Shell univalve, ſpiral, ſomewhat conic. Aperture ſomewhat angular, or rounded: the upper ſide tranſverſe and contracted; pillar placed obliquely.

28. T. Animal a limax. Shell univalve, ſpiral, ſolid. Aperture contracted, orbicular, entire.

29. H. Animal a limax. Shell univalve, ſpiral, ſubdiaphanous, brittle. Aperture contracted, ſemilunar or roundiſh.

30. N. Animal a limax. Shell univalve, ſpiral, gibbous, flattiſh at bottom. Aperture ſemiorbicular or ſemilunar, pillar lip tranſverſely truncated and flattened.

31. H. Animal a limax. Shell ear-ſhaped dilated, with a longitudinal row of orifices along the ſurface; the ſpire lateral and nearly concealed.

32. P. Animal a limax. Shell ſubconic, without ſpire.

33. D. Animal a terebella. Shell tubular, ſtraight, or ſlightly curved, with one cavity open at both ends.

34. S. Animal a terebella. Shell tubular, generally adhering to other ſubſtances (often ſeparated internally by entire diviſions.)

35. T. Animal a terebella. With two calcareous, hemiſpherical valves, anteriorly cut off, and two lanceolate ones. Shell round, flexuous, penetrating wood.

36. S. Animal a nereis. With a ringent mouth, and two thicker tentacula behind the head. Shell tubular, conſiſting of particles of ſand united to a membrane by a glutinous cement.

I. MULTIVALVES.

24 Chiton.

Gen. 1. Chiton.

Gen. Char. The animal inhabiting this ſhell is a doris, The ſhell conſiſts of ſeveral ſegments or valves, arranged along the back.

Species.

hiſpidus. 1. C. ſhell with ſix plates or valves ſtriated. America.

thalaſſinus. 2. C. ſhell ſix-valved, glabrous, oval, a little convex, ſea-green. America.

tuberculatus. 3. C. ſhell ſeven-valved, body tuberculated. America.

crinitus. * 4. C. ſhell ſeven-valved, thick ſet with ſhort hairs, ⅝ inch long. Sandwich, Aberdeen.

aculeatus. 5. C. ſhell eight-valved, ſtriated; body prickly. Aſia.

faſciculatus. * 6. C. ſhell eight-valved, apparently ſmooth, but when examined with a glaſs, is found to be rough like ſhagreen. Coaſt of Barbary, Salcomb bay, Devonſhire, Sandwich.

ſquamoſus. 7. C. eight valves, ſemiſtriated; margin covered with minute ſcales. America.

punctatus. 8. C. with eight valves, ſmooth body with excavated dots. Europe, America.

9. C. eight valves, ſubſtriated; ſtriæ covered, body red. North ſeas. *ruber.*

* 10. C. eight valves, ſmooth, with tranſverſe lines at the margin of the valves; body white, oval; firſt valve notched on the hinder edge. Northern ſeas; on oyſter ſhells from Poole. *albus.*

11. C. eight valves, ſmooth, carinated, oval, compreſſed. Northern ſeas, Salcomb bay. *cinereus.*

12. C. ſeven carinated valves ſtrongly beaked; beaks frequently rufous, ½ inch long. Salcomb bay, but rare. *Montagu, Teſt. Brit.* p. 3. *ſeptemvalvis.*

13. C. eight-valved, thick ridged; the outſide ſea-green, inſide ſnowy, edged with black. *bicolor.*

14. C. eight-valved, cherry colour, ſmooth, with ſnowy marginal teeth. *ceraſinus.*

15. C. eight-valved, thick, black brown. Straits of Magellan. *magellanicus.*

16. C. eight-valved, brown, ſmooth; inſide teeth of the margin ſnowy. India. *fuſcus.*

17. C. eight-valved, ſmooth, within ſea-green margin covered with gray white ſcales. *maculatus.*

18. C. eight-valved, ſmooth, varied with white and black. Var. ſeven-valved. America. *marmoratus.*

19. C. flat above, with numerous raiſed dots in rows; border broad, ſpinous. America. *granulatus.*

20. C. eight-valved, ſmooth above, piceous and varied with white and black. America; Red ſea. *piceus.*

indus. 21. C. eight-valved, whitiſh aſh colour, with a ſcaly border; middle valves finely punctured. America.

minimus. 22. C. eight-valved, ſmooth, black, very ſmall. Norway ſeas.

cimex. 23. C. eight-valved, carinated, diaphanous, banded; extreme valves finely punctured; ſmall. Norway.

aſellus. 24. C. eight-valved, deep black, convex above, with a yellowiſh ſpot on each valve. North ſeas.

gigas. 25. C. eight-valved, thick, convex, white; firſt valve notched, laſt toothed, middle ones emarginate; four inches long. Cape of Good Hope.

iſlandicus. 26. C. eight-valved, ſubcylindrical, finely punctured; very minute and narrow at each end.

marginatus. * 27. C. eight-valved, carinated along the back; the valves projecting over each other in a point. Salcomb bay, Sandwich.

lævis. * 28. C. eight-valved, ſmooth, with an elevated band down the back; the length ½ inch. Loch Broom, Roſs-ſhire, Salcomb bay.

amiculatus. 29. C. eight-valved, kidney-ſhaped, fragile; valves imbricated. Kurile iſlands.

25 Lepas.

Gen. 2. LEPAS, *Acorn-ſhell.*

Gen. Char.—Animal a triton; ſhell affixed at the baſe, and compoſed of many unequal erect valves.

SPECIES.

balanus. * 1. L. conic, grooved, lid ſharp-pointed. European ſeas, Britain.

balanoides. * 2. L. conic, truncated, ſmooth; lip obtuſe. American and Indian ſeas; abundant on the coaſts of Britain.

intertexta. * 3. L. ſomewhat depreſſed; valves imbricated and obliquely ſtriated. Weymouth.

cornubienſis. * 4. L. baſe dilated, aperture rather narrow; valves grooved near the lower edges. Cornwall.

tintinabulum. 5. L. conic, obtuſe, bell-ſhaped, rugged and fixed. Indian and American ſeas.

diadema. * 6. L. roundiſh, ſix-lobed; valves grooved longitudinally. European and Indian ſeas, Scotland.

balænaris. 7. L. ſubconic, with ſix elevated, wrinkled, 4-parted lobes; lid membranaceous, and two-toothed; found adhering to the pectoral wrinkles of the balæna boops.

coſtata. * 8. L. ſomewhat conic, with equidiſtant ribs, divergent from the aperture; lid pointed. On rocks on the Pembrokeſhire coaſt.

conoides. * 9. L. conic, ſmooth, valves pointed, aperture very ſmall; ſhell ſmall, reddiſh; valves finely teſſelated. Weymouth.

teſtudinaria. 10. L. plano-convex, with ſix excavated ſtriated rays; lid compoſed of four triangular pieces inſerted on a membrane.

galeata. 11. L. helmet-form, with a lateral aperture; ſhell boat-ſhaped, ſmooth. Adheres to the gorgonia verrucoſa, and ventilabrum.

palmipes. 12. L. erect, conic; valves palmated at the baſe; ſhell white.

tulipa. 13. L. ſubcubic, ſmooth; lid acute, tranſverſely ſtriated. Northern ocean.

mitella. 14. L. compreſſed, erect, irregularly ſtriated. Indian ocean.

* 15. L. compreſſed, 13-valved, ſmooth, ſeated on a ſcaly peduncle, which is large, and compoſed of rings, covered with ſhort hairs. North ſeas, Plymouth. *ſcalpellum.*

* 16. L. compreſſed, five-valved, ſtriated, pedunculated. American and Atlantic ſeas, coaſt of Devonſhire; is ſometimes found in a foſſil ſtate. *anſerifera.*

* 17. L. compreſſed, 5-valved, pedunculated; adheres to the bottom of ſhips, when it is well known by the name of *bernacle.*— It was from this ſpecies of ſhell that the bernacle gooſe was ſuppoſed to have had its origin. Gerard's account of this transformation, as it affords a remarkable inſtance of the credulity of the times, is too curious to be omitted. "There are found in the north parts of Scotland, and the iſlands adjacent called Orchades, certain trees whereon do grow certain ſhells tending to ruſſet, wherein are contained little living creatures: which ſhells in time of maturitie do open, and out of them grow thoſe little living things, which falling into the water do become fowles, which we call barnakles; in the north of England brant geeſe; and in Lancaſhire, tree geeſe; but the other that do fall upon the land periſh, and come to nothing. Thus much from the writings of others, and alſo from the mouths of people of thoſe parts, which may very well accord with truth." *anatifera.*

"But what our eyes have ſeene, and hands have touched, we ſhall declare. There is a ſmall iſland in Lancaſhire, called the Pile of Foulders, wherein are found the broken pieces of old and bruiſed ſhips, ſome whereof have been caſt thither by ſhipwracke, and alſo the trunks and bodies with the branches of old and rotten trees, caſt up there likewiſe: whereon is found a certain ſpume or froth that in time breedeth into certaine ſhells, in ſhape like thoſe of the muſkle, but ſharper pointed, and of a whitiſh colour: wherein is contained a thing in forme like a lace of ſilke, finely woven, as it were, together, of a whitiſh colour, one end whereof is faſtened unto the inſide of the ſhell, even as the fiſh of oiſters, and muſkles are: the other end is made faſt unto the belly of a rude maſs or lumpe, which in time commeth to the ſhape and forme of a bird: when it is perfectly formed the ſhell gapeth open, and the firſt thing that appeareth is the foreſaid lace or ſtring; next come the legs of the bird hanging out, and as it groweth greater it openeth the ſhell by degrees, till at length it is all come forth and hangeth only by the bill: in ſhort ſpace after it cometh to full maturitie, and falleth into the ſea, where it gathereth feathers, and groweth to a fowl bigger than a mallard, and leſſer than a gooſe, having blacke legs, bill or beake, and feathers blacke and white, ſpotted in ſuch manner as is our magpipe, called in ſome places a pie-annet, which the people of Lancaſhire call by no other name than a tree-gooſe: which place aforeſaid, and thoſe parts adjoyning do ſo much abound therewith, that one of the beſt is bought for threepence. For the truth hereof, if any doubt, let them repaire unto me, and I ſhall ſatisfie them by the teſtimonie of good witneſſes. *Herball*, p. 1588.

18. L. membranaceous, ventricoſe, ſeated on a tube and eared, 8-valved. North ſeas. *aurita.*

19. L. hooked behind, 6-valved, wrinkled, not an inch long. Chili. *pſittacus.*

20. L.

minor. 20. L. reddiſh, 6-valved, unequal; lid pointed. India.

verruca. 21. L. hemiſpherical, ſerrated, 6-valved; 4 outer valves and lid plaited. North ſeas.

anguſtata. 22. L. elongated, ſmooth, 6-valved; aperture narrow, lid minute.

poroſa. 23. L. granulated and ſtriated, conic, tubular; lid obtuſe. India.

elongata. * 24. L. cylindrical, ſnowy, pellucid, 6-valved; lid obtuſe, grooved and tranſverſely ſtriated. Three inches long. Iceland, Weymouth. *Balanus Clavatus, Montagu*, p. 10.

patellaris. 25. L. 6-valved; outwardly violet mixed with white, and marked with fine longitudinal ſtriæ; valves denticulate at the margin. Coromandel, very rare.

ſpinoſa. 26. L. conic with 12 triangular valves, 6 more depreſſed, whitiſh and tranſverſely ſtriated, and 6 purple and longitudinally ſtriated; all armed with tubular recurved ſpines. India.

violacea. 27. L. 6-valved, thick, glabrous, white with violet rays. India.

pollicipes. 28. L. many-valved, compreſſed, erect, ſmooth; ſeated on a ſhort, hard, ſcaly peduncle. Mediterranean.

cylindrica. 29. L. ſlightly curved, with a large oblique orifice; lip horned. Africa.

criſpata. 30. L. oval-truncated, conic, with 6 bluiſh valves ſhaded with white, and 6 reddiſh, elevated, ſpinous, and perpendicularly ſtriated; an inch high; is frequently perforated by the teredo.

curioſa. 31. L. ſolid, white, depreſſed with carinous grooves, unequally ſmooth internally. Kurile iſlands.

ſtrœmia. 32. L. conico-convex, 4 valves ſerrate-ſtriated; lid 2-valved. North ſeas.

faſcicularis. * 33. L. 5-valved, ſmooth, dorſal valve dilated at the baſe. St George's Channel.

26
Pholas.

Gen. 3. PHOLAS.

Gen. Char.—The animal is an aſcidia. Shell bivalve, divaricate, with ſeveral leſſer differently acceſſory ones at the hinge. Hinges recurved, united by a cartilage. Beneath the hinge internally is an incurved tooth.

SPECIES.

dactylus. * 1. P. oblong, with reticulated, ſubſpinous ſtriæ, on the upper part. Europe. Salcomb bay, Devonſhire. Five inches long; is found in hard clay, marl, and wood; has a phoſphoreſcent property.

coſtata. 2. P. ovate; ſtriated with elevated ribs; 6 inches long. American ſeas.

ſtriata. 3. P. ovate, multifariouſly ſtriated. Europe, India. —This ſpecies ſeems to be nearly equally deſtructive with the teredo navalis. The pholas perforates the wood acroſs the grain or fibre; the teredo inſinuates itſelf along the fibres, or in the ſame direction.

candida. * 4. P. oblong, muricated on all ſides, with decuſſated ſtriæ. Europe, America, Salcomb bay.

puſilla. 5. P. oblong, rounded; ſtriæ arched. America, India. This animal penetrates the bottom of ſhips.

criſpata. * 6. P. oval; part next the hinge more obtuſe, waved, ſtriated; tooth of the hinge curved, large and ſtrong. Two inches long. Europe. Weſt of England.

orientalis. 7. P. oblong, with a ſtrait margin: one half quite ſmooth, the other reticulated with ſtriæ. Siam and Tranquebar.

campechiana. 8. P. narrow, white, finely ſtriated. Bay of Campeachy.

cordata. 9. P. ſhort, turgid, furrowed, with fine elevated tranſverſe ſtriæ; aperture heart-ſhaped.

chilenſis. 10. P. oblong, depreſſed, with diſtant longitudinal ſtriæ; five inches long. Chili.

teredula. 11. P. oblong, white, with a longitudinal brown granular ſuture; penetrates timber. Belgic ſhores.

hians. 12. P. bivalve, white, with tranſverſe arched ſtriæ; convex in the middle; aperture large, oval; perforates calcareous rocks. American iſlands.

II. BIVALVE SHELLS.

27
Mya.

Gen. 4. MYA.

Gen. Char.—The animal is an aſcidia. The ſhell is bivalve, generally gaping at one end. The hinge has broad, thick, ſtrong teeth, ſeldom more than one, and not inſerted into the oppoſite valve.

SPECIES.

truncata. * 1. M. ovate, truncated, gaping greatly behind; tooth projecting, obtuſe; 2½ inches long. Europe.

declivis. * 2. M. brittle, ſemitranſparent, ſloping downwards near the open end. Hebrides.—A fiſh much eſteemed as food by the inhabitants.

arenaria. * 3. M. ovate, rounded behind; 2½ inches long. European ſeas, Portſmouth.

pictorum. * 4. M. ovate; a ſingle, longitudinal, notched tooth, in one hinge, and two in the other; near 2 inches long, and 3½ broad. Europe, Barbary, River Kennet, Berkſhire.—This ſhell is employed by painters for holding water colours.

margaritifera. * 5. M. ovate, a little contracted in the middle of the thinner margin; primary tooth of the hinge conic; length 2½ inches, breadth 5 inches; inhabits moſt parts of the arctic circle, and is moſt frequently found in mountainous rivers, and about cataracts.—This ſhell yields mother-of-pearl and pearl. The river Conway in Wales, was formerly famous for producing pearls of great ſize and value. They have alſo been found in the river Irt, in Cumberland. Sir John Hawkins obtained a patent for fiſhing them in that river.

perna. 6. M. oblong, dilated; the narrower baſe compreſſed. Straits of Magellan, Barbary.

vulſella. 7. M. tongue-ſhaped; hinge terminal, ſemiorbicular; 4 inches long, and 1½ broad. Indies.

arctica. 8. M. ſtriated, valves with two ſubſpinous ridges; hinge without teeth. North ſeas.

edentula. 9. M. oval, equivalve, widely gaping, and ſtriated; 1 inch long. Shores of the Caſpian ſea.

radiata. 10. M. equivalve, pellucid, finely ſtriated. Rivers of Malabar.

oblonga. 11. M. ovate, oblong; 3 inches broad, 1½ long.

anatina. 12. M. globular, ſnowy, pellucid. Guinea.

nicobarica. 13. M. equivalve, ſnowy, ovate, oblong; ſtriæ decuſſated. Nicobar iſlands.

auſtralis. 14. M. ovate, compreſſed, cloſed. New Zealand.

gaditana. 15. M. rounded, flattiſh, tranſverſely ſtriated. Cadiz.

corrugata. 16. M. rhombic, green, protuberant parts wrinkled. Rivers of Coromandel.

rugoſa. 17. M. oval, wrinkled, outwardly greeniſh, within pearly. Rivers of Coromandel.

nodoſa. 18. M. oval, greeniſh; protuberant parts knotty.

norwegica. 19. M. oval, longitudinally and thickly ſtriated; one end rounded, the other truncated.

ſpuria. 20. M. rhombic; protuberant part glabrous. Rivers of Tranquebar.

glycemeris. 21. M. gaping at both ends, thick, lamellous, oblong, oval; 5 inches long, 10 broad. Mediterranean ſea.

ſyrmatophora. 22. M. ovate, depreſſed; margin of the hinge with a ſubulate projection near the primary tooth; that of the other valve dilated. Rivers of Guinea.

nitida. 23. M. oval, ſmooth; an obtuſe tooth in each hinge. Norway.

membranacea. 24. M. ovate, membranaceous, with a protracted reflected margin at the proboſcis.

byſſifera. 25. M. coarſe, thick, oblong, ſtriated, convex; hinge without a tooth. Greenland coaſt.

dubia. * 26. M. with an oval and large hiatus oppoſite to the hinge; length of a horſe bean. Weymouth.

inæquivalvis. * 27. M. ſubtriangular, opaque, white; under valve deep; upper valve not half the ſize of the other. Cornwall, Devonſhire. *Montagu, Teſt. Brit.* p. 38.

ſuborbicularis. * 28. M. ſubpellucid, faintly ſtriated tranſverſely; ſides nearly equal, rounded; hinge central, ⅜ of an inch; found in hard limeſtone at Plymouth. *Montagu, Teſt. Brit.* p. 39.

prætenuis. * 29. M. oval, thin, brittle, flat; ſtriæ fine, concentric. Falmouth harbour.

diſtorta. * 30. M. ſubpellucid, thin, fragile, diſtorted into various ſhapes. Falmouth. *Montagu, Teſt. Brit.* p. 42.

bidentata. * 31. M. ſuboval, compreſſed; hinge with two broad, erect, laminated teeth in one valve; none in the other. Salcomb bay.

28 Solen.

Gen. 5. SOLEN, *Razor-ſheath.*

Gen. Char.—The animal inhabiting this ſhell is an aſcidia: ſhell bivalve, oblong, open at both ends; hinge with a ſubulate reflected tooth, often double, and not inſerted in the oppoſite valve.

SPECIES.

vagina. * 1. S. linear, ſtraight, roundiſh; one end margined; hinge with a ſingle oppoſite tooth in each valve. European and Indian ſeas, Caermarthenſhire, Weymouth.

ſiliqua. * 2. S. linear, ſtraight, one hinge 2-toothed. European and Indian ſeas. Length 1 inch, breadth 8 inches. Common on the ſhores of Britain, where it is employed as food.—This ſpecies lurks in the ſand, near low-water mark, in a perpendicular direction, and when in want of food, they raiſe one end above the ſurface, and protrude the body a conſiderable way out of the ſhell. At the approach of danger they dart deep into the ſand, as far even as to the depth of two feet; and the place is known by a ſmall hollow on the ſurface. They are ſometimes taken by digging them out of the ſand, or by ſtriking a barbed dart into their bodies.

enſis. * 3. S. linear, in form of a ſcymeter; one hinge 2-toothed; ¾ of an inch long, 5 inches broad. European ſeas; not uncommon on the Britiſh ſhores.

pellucidus. * 4. S. ſubarched, ſuboval, pellucid; one hinge 2-toothed; length ¼ incb, breadth above one inch. Angleſea, Cornwall.

legumen. * 5. S. linear, oval, ſtraight; hinge in the middle 2-toothed, one of them bifid; 2½ inches broad. European and Atlantic ſeas, Angleſea, Hampſhire.

cultellus. * 6. S. kidney-ſhaped, a ſingle tooth in one valve, two in the other. Europe and India, Cornwall.

radiatus. 7. S. oval, ſtraight, ſmooth, with a tranſverſe, depreſſed rib on one ſide. India.

ſtrigilatus. 8. S. oval, obliquely ſtriated. Atlantic and Indian ſeas.

anatinus. 9. S. ovate, membranaceous, hairy, with a falcated rib at the hinge. Indian ocean.

macha. 10. S. oval, oblong, truncated before. Pacific ocean.—This ſpecies produces pearl.

bullatus. 11. S. roundiſh, inflated, ſubſtriated. Indian and American ſeas.

minutus. * 12. S. oval; angles of the valves ſerrated; ſize of a cucumber ſeed. Coral rocks in Norway and Greenland; in hard limeſtone at Plymouth.

virens. 13. S. ovate, oblong, with tumid boſſes. Java.

diphos. 14. S. oval, ſtraight, ſmooth, with prominent membranes; 2½ inches long, 5 broad. Indian ocean.

minimus. 15. S. linear, oval, ſtraight. Tranquebar.

maximus. 16. S. linear, oval, ſtraight, with arched ſtriæ. Nicobar. A very rare ſpecies.

coarctatus. 17. S. tranſverſely wrinkled, contracted in the middle, rounded at both ends; ¾ of an inch long, 2½ broad. Nicobar iſlands.

roſeus. 18. S. equivalve, roſy, tooth of the hinge ſubbifid. Red ſea.

ſanguinolentus. 19. S. oval, quite ſmooth; hinge callous, two-toothed. Jamaica.

ſtriatus. 20. S. equivalve, tranſverſely ſtriated; hinge with a ſingle tooth. Nicobar iſlands.

occidens. 21. S. tranſverſely ſtriated, hinges two-toothed, with a hollow in the middle; 4 inches broad, and 2 long.

criſpus. * 22. S. partly ſmooth, partly rough, with undulated, crimped lines. River Tees in England.

ſpengleri. 23. S. protuberances or beaks of the ſhell 2-parted, an inch long, 2½ broad; rounded at the ends.

pinna. * 24. S. pellucid, fragile, depreſſed; ſuboval, concentrically wrinkled; a blunt tooth in each valve; ⅜ of an inch long, and ¾ broad. Torcroſs. *Montagu, Teſt. Brit.* p. 566.

Gen. 6. TELLINA.

29 Tellina.

Gen. Char.—The animal is a tethys: the ſhell is bivalve, generally ſloping on one ſide; in the fore part of one valve there is a convex, and in that of the other, a concave fold; the hinge has uſually three teeth, the lateral ones flat, or nearly obſolete, in one valve.

SPECIES.

A. *Ovate and thickiſh.*

gargadia. 1. T. roundiſh, compreſſed, wrinkled on the fore-part. Indian ocean, very rare.

lingua felis. 2. T. ſubovate, rough, with lunated ſcales, diſpoſed in a quincunx. Indian ocean.

virgata. 3. T. angular, with tranſverſe, recurved ſtriæ; 2 inches long, and 2½ broad. Indian and Atlantic oceans.

angulata. 4. T. ſubovate, angular before, with tranſverſe, recurved ſtriæ; no lateral teeth; 1½ inch long, and 2 broad. Indian ocean.

5. T.

gari. 5. T. ſtriæ recurved, tranſverſe; lateral teeth obſolete. Indian ocean.

fragilis. * 6. T. ovate, white, gibbous, with tranſverſe, recurved ſtriæ; beaks yellowiſh. European ſeas, Britain.

depreſſa. * 7. T. very thick, depreſſed, oblong, with tranſverſe, concentric ſtriæ. Europe, Britain.

craſſa. * 8. T. very thick, broad, depreſſed; concentric ſtriæ numerous, $1\frac{1}{4}$ inch broad, and $1\frac{1}{4}$ long. Europe, Britain.

rugoſa. 9. T. wrinkles tranſverſely undulated, hinged with two lateral teeth. Indian and American ſeas.

inflata. 10. T. rounded, thick, gibbous; ſtriæ longitudinal, fine.

multangulata. 11. T. ovate, ventricoſe, inequivalve, with decuſſated ſtriæ. Tranquebar.

papyracea. 12. T. thin, ovate, ventricoſe, and tranſverſely ſtriated; wrinkles on the fore part, plaited; 3 lines long, and an inch and a half broad. Guinea.

gippoſa. 13. T. angular, ventricoſe, and finely ſtriated tranſverſely.

inæquilatera. 14. T. equivalve, roundiſh, white, with a few tranſverſe ſtriæ round the edges.

knorii. 15. T. rich red colour, with a violet margin; $2\frac{1}{4}$ inches broad, and $1\frac{1}{2}$ long.

bornii. 16. T. tranſverſely ſtriated; one ſide bent and reddiſh, with red rays; $\frac{3}{4}$ inch long, and 2 inches broad.

puſilla. 17. T. ovate, ventricoſe, thin, tranſverſely ſtriated, very minute. Rivers of Europe.

maculata. * 18. T. ſubovate, thickiſh, with decuſſated ſtriæ, and irregular ſpots; figure of the ſpots different in different ſhells, but exactly ſimilar in both valves of the ſame ſhell. Denbigh in England.

rivalis. * 19. T. obliquely ſubovate, tranſverſely grooved; ſize of a pea. River Avon near Saliſbury.

B. *Ovate, compreſſed.*

albida. 20. T. oval, ſmooth, with prominent membranes; ſize of an egg. European ocean.

foliacea. 21. T. oval, with rough pubes, flattened ſides, ſerrated; $1\frac{1}{2}$ inch long, and 3 broad. Indian ocean.

planata. * 22. T. ovate, compreſſed, tranſverſely ſubſtriated, ſmooth, with acute margins. European and Mediterranean ſeas; common on the ſhores of Britain.

variabilis. * 23. T. ovate, oblong, with pale purple eyes. European and Atlantic ſeas, Britain.

lævigata. 24. T. ovate, ſmooth, lateral teeth, margined. European and Indian ſeas.

radiata. * 25. T. oblong; ſtriæ faint, longitudinal. European and American ſeas, Britain.

roſtrata. 26. T. oblong, the fore-part produced into an angular beak. Indian ocean.

inæquivalvis. 27. T. oblong, produced into a beak, upper valve flat, lower convex; length $\frac{1}{2}$ inch, breadth 1 inch. European and North ſeas.

trifaſciata. * 28. T. ovate, ſmoothiſh, triradiate, with red and ſlightly ſtriated tranſverſely. European ſeas, Britain.

incarnata. * 29. T. ovate, a little produced on the fore-part, flattiſh; 2 inches broad. European and Mediterranean ſeas, Britain.

donacina. * 30. T. ovate, flattiſh, very obtuſe on the fore-part. Mediterranean, Sandwich, Weymouth.

truncata. 31. T. oval, compreſſed, ſubſtriated; fore-part truncated. Java.

trilatera. 32. T. flat, fore-part truncated, yellow; $1\frac{1}{2}$ inch long, and 2 broad.

oblonga. 33. T. oblong, brittle, yellowiſh; rounded on one ſide. Europe.

ſpengleri. 34. T. white, tranſverſely ſtriated, and bifariouſly hooked on each ſide. Nicobar iſlands.

rugoſa. * 35. T. with rugged, concentric ſtriæ; the ſize of a filbert. Weymouth.

cornubienſis. * 36. T. oval, oblong, deeply ſtriated, parallel to the margin. Cornwall.

fervenſis. * 37. T. oblong, ovate, compreſſed, with fine, tranſverſe ſtriæ; 1 inch long, and 2 broad. North ſeas, Weymouth, Yorkſhire.

operculata. 38. T. purple, with white bands, and decuſſated ſtriæ; one valve convex, the other flat; $2\frac{1}{4}$ inches broad and $1\frac{1}{4}$ long.

hyalina. 39. T. oval, inequivalve, flat, pellucid, with fine decuſſated ſtriæ; $1\frac{1}{2}$ inch long, 3 broad. Guinea.

vitrea. 40. T. yellowiſh, very thin, perpendicularly ſtriated. North and Baltic ſeas.

lanceolata. 41. T. oval, very thin, tranſverſely ſtriated; 10 lines long, $1\frac{1}{2}$ inch broad. India.

apelina. 42. T. oval, pellucid, with a rib in each valve, reaching from the hinge to the outer margin; very thin. Nicobar.

coccinea. 43. T. oval, pellucid, ſcarlet, tranſverſely ſtriated, very thin. Sea round Iceland.

virginica. 44. T. ſtriæ fine, tranſverſe, lengthened forwards into a beak, very ſmall and rounded. Rivers of Virginia.

alata. 45. T. nearly triangular, margin dilated; 2 inches broad, and $1\frac{1}{3}$ long.

pectinata. 46. T. rounded, flat, thin, with longitudinal ſtriæ.

anguſtata. 47. T. flattiſh, red, with white rays; one end pointed, the other rounded.

variegata. 48. T. oval, rounded at one end; variegated, with a whitiſh ray at the crown.

madagaſcarienſis. 49. T. oval, a little pointed at one end; $2\frac{1}{2}$ inches long, and $3\frac{1}{2}$ broad. Madagaſcar.

purpureſcens. 50. T. purpliſh at each end; $1\frac{1}{2}$ inch long, and ſomething broader.

aſpera. 51. T. pointed at one end, yellowiſh within, radiated and rough with tranſverſe ſtriæ without; $1\frac{3}{4}$ inch long, and 3 inches broad.

triangularis. 52. T. ſlightly wedged, whitiſh, and tranſverſely ſtriated; $1\frac{1}{2}$ inch broad, and 1 long.

lata. 53. T. white, with unequal ſides, pointed at one end; $1\frac{1}{3}$ inch long, and 2 broad. Norway ſeas.

jamaicenſis 54. T. thick, beak purpliſh without. Jamaica.

rhomboides. * 55. T. outwardly white and rough, with tranſverſe ſtriæ; within bluiſh; 2 inches broad, 1 long. River Tees, England.

vinacea. * 56. T. purpliſh, tawny, with white rays; 1 inch long, and $1\frac{1}{2}$ broad. Britiſh and Baltic ſeas.

zonata. 57. T. roſy, with a white band. Shores of Tuſcany.

albicans. 58. T. whitiſh, with a paler band; within yellow.

rufeſcens. 59. T. reddiſh, with pale yellow ſpots, and decuſſated ſtriæ; $\frac{3}{4}$ inch long, $1\frac{1}{2}$ broad.

plana. 60. T. unequal ſided, depreſſed, minutely ſtriated.

ſtriata. 61. T. unequal ſided, round at both ends, roſy white, pellucid; 2 inches broad, $1\frac{1}{3}$ long.

roſea. 62. T. roſy, with thin ribs running from the hinge to the margin; 1 inch long, $1\frac{1}{2}$ broad.

punicea. 63. T. oval, flat, equal ſided, tranſverſely ſtriated; 1 inch long, 2 broad.

complanata. 64. T. obovate, flattened; obſoletely ſtriated, reddiſh, with a dilated margin; 2 inches long, 3 broad.

fabula. * 65. T. ovate, compreſſed, inflated, lengthened before; one valve ſmooth, the other with oblique, reflected ſtriæ. Mediterranean, American and North ſeas, Wales.

adanſoni. 66. T. whitiſh, with a violet hinge. Africa.

cancellata. 67. T. thin, with numerous longitudinal grooves croſſing the tranſverſe wrinkles. Atlantic.

ſtrigoſa. 68. T. with whitiſh bands, glabrous and wrinkled at the margin. African ſhores.

C. *Suborbicular.*

balauſtina. 69. T. dilated, orbicular, lateral teeth in one valve. Mediterranean.

remies. 70. T. compreſſed and tranſverſely wrinkled; 3 inches long, 3½ broad. Indian and American oceans.

reticulata. 71. T. lentiform, compreſſed, reticulate. India.

ſcobitina. 72. T. lentiform, rough, with lunated ſcales diſpoſed in a quincunx; 2¼ inches long, 2¾ broad. Indian ocean.

lactea. 73. T. lentiform, gibbous, white, pellucid, ſmooth. Mediterranean.

carnaria. * 74. T. white, with a roſy tinge within and without; fine ſtriæ, diſpoſed obliquely. Europe and American iſlands, Britain.

bimaculata * 75. T. triangularly rounded, ſmooth, whitiſh, with two oblong red ſpots on the inſide; ſcarcely an inch broad. Europe and American ſeas, Britain.

balthica. 76. T. roundiſh, ſmooth, outſide bloom colour; ſize of a horſe bean. Baltic.

piſiformis. 77. T. ſubglobular, ſmooth, obliquely ſubſtriated; ſize of a pea; mouths of rivers in Europe.

divaricata. 78. T. ſubglobular, white, with oblique bifarious ſtriæ. American ſeas.

digitaria. 79. T. ſubglobular, pale, ſurrounded with oblique uniform ſtriæ; ſize of a pea, nearly an inch long. American and Indian ſeas.

cornea. * 80. T. globular, glabrous, horn-colour, with a tranſverſe groove; ſize of a pea. Ponds and freſh waters of Europe, Britain.

lacuſtris. 81. T. rhombic, flattiſh, glabrous, with an acute protuberance. Pools and marſhes of Europe.

amnea. 82. T. heart-ſhaped, tranſverſely grooved. Pools and ditches of Europe.

fluminalis. 83. T. triangular, gibbous, tranſverſely ſtriated. River Euphrates.

fluminea. 84. T. triangular, gibbous, tranſverſely ribbed. China.

fluviatilis. 85. T. triangular, tranſverſely wrinkled. Canton.

iberica. 86. T. globular, ſmooth, poliſhed. Shores of Iberia.

adriatica. 87. T. ſubglobular, margined, denticulated, white without, pearly within. Shores of the Adriatic.

ſinuoſa. 88. T. ſubglobular, equivalve and equal-ſided, with a few tranſverſe ſtriæ.

purpurata. 89. T. equal ſided, ſmooth, lucid purple colour; one inch long, 1½ broad.

candida. 90. T. white, with fine tranſverſe ſtriæ.

gallica. 91. T. triangular, pectinated. France.

ſenegalenſis. 92. T. triangular, globoſe, with tranſverſe grooves. Africa.

anguloſa. 93. T. oval, flattiſh, tranſverſely ſtriated, fore-part angularly inflected. America.

94. T. tranſverſely ſtriated, orbicular, angular on the fore-part. India. *polygona*

Gen. 7. CARDIUM, *Cockle.* 30 Cardium.

Gen. Char.—The animal is a tethys: the ſhell is bivalve, nearly equilateral, equivalve, generally convex, longitudinally ribbed, ſtriated or grooved, with a toothed margin. Hinge of the two teeth near the beak, and a larger remote lateral one on each ſide; each locking into the oppoſite.

SPECIES.

1. C. gibbous, equivalve, with elevated, carinated, concave, membranaceous ribs; three inches long, three and a half broad, three high. African ocean. *coſtatum.*

2. C. heart-ſhaped, valves compreſſed and carinated with teeth; two inches and a half long, above two broad. Indian ocean. *cardiſſa.*

3. C. heart-ſhaped; fore part ſurrounded with lines, hind part with broader ſtriæ, forming by their union the figure of a heart. Nicobar iſlands. *roſeum.*

4. C. heart-ſhaped; valves ſtriated, notched; behind the beaks a lunated heart-ſhaped gape; two inches long, and nearly the ſame breath. India, Arabia, and Egypt. *retuſum.*

5. C. heart-ſhaped, ſubquadrilateral; valves carinated, beaks diſtant. Indian ocean. *hemicardium.*

6. C. heart-ſhaped, ſubtrilateral; valves tranſverſely grooved, and the fore-part longitudinally ſtriated; has only been found in the foſſil ſtate. *lithocardium.*

7. C. heart-ſhaped, carinated; fore-part obliquely truncated, thin, quite ſmooth, ſnowy, with gilt ſtriæ above an inch long. *lineatum.*

* 8. C. ſomething heart-ſhaped, ſubangular; valves angular, grooved, ſmooth. European and American ſeas, coaſt of Durham. *medium.*

* 9. C. ſomewhat heart-ſhaped, ribs high, and grooved down the middle, and beſet with large hollowed ſpines near the circumference. European and Mediterranean ſeas, Devonſhire. *aculeatu*

* 10. C. ſlightly heart-ſhaped; ribs ſpinous, carinated. European ſeas, Britain. *echinatum*

* 11. C. ſlightly heart-ſhaped, triangular ribs, beſet along the ridges with thin ſpines; ſize of a hazel-nut. European ſeas, Cornwall. *ciliare.*

12. C. ſlightly heart-ſhaped, with elevated, ſubtriangular, ciliated grooves. North ſeas. *ciliatum.*

13. C. ſomewhat heart-ſhaped, with obtuſe, knotty, tranſverſely ſtriated grooves. Mediterranean. *tuberculatum.*

14. C. hear-ſhaped, with arched imbricated ſcales along the grooves. Mediterranean. *iſocardia.*

15. C. ſomewhat heart-ſhaped, ſubangular. India. *fragum.*

16. C. ſubcordate, with lunated, coloured grooves. India. *unedo.*

17. C. ſubcordate, grooved, and muricated at the ſides. America. *muricatu*

18. C. oblong, with angular grooves, ſerrated at the ſide. America and India. *magnum.*

19. C. ſubovate, grooved; anterior margin rough, poſterior one toothed. India. *flavum.*

* 20. C. obovate, with obſolete, longitudinal ſtriæ, and a few tranſverſe ones concealed by a gloſſy, yellowiſh brown epidermis. European and American ſeas, Britain. *lævigatu*

ſerratum. 21. C. obovate, ſmooth, with obſolete ſtriæ; interior margin ſerrated. Mediterranean and Indian ſeas.

edule. * 22. C. antiquated, with 28 depreſſed ribs, with obſolete, recurved ſcales. Abounds frequently on all ſandy coaſts, and is lodged a little beneath the ſand. This is employed as a wholeſome and nouriſhing food. It is the common cockle of this country.

icelandicum. 23. C. grooved with about 36 triangular, ſmooth ribs. Iceland and Greenland ſeas.

greenlandicum. 24. C. antiquated, glabrous, thin, with angular ferruginous lines; two and three-fourths inches long, three and a half broad. Greenland and Iceland.

ruſticum. 25. C. antiquated, with 20 remote grooves, the intermediate ſpaces rugged. Mediterranean ſeas.

glaucum. 26. C. ſubantiquated, hind-part with 20 grooves imbricated upwards. Barbary.

pectinatum 27. C. ſlightly heart-ſhaped and pectinated. Mediterranean.

virginicum 28. C. triangular, rounded, equilateral, with tranſverſe, membranaceo-recurved wrinkles; hinges blue. Mediterranean.

trilaterum. 29. C. triangular, gibbous, ſtriated. Caſpian ſea.

auricula. 30. C. heart-ſhaped, ſubrhombic, 24 ribs on each ſide; the grooves finely notched; two and one-fourth inches long, one and three-fourths broad. Arabia and Egypt.

triſte. 31. C. oval, ſmooth; margin ſtriated on each ſide the beak.

monſtroſum. 32. C. gibbous; one ſide impreſſed and ochraceous, the other convex, heart-ſhaped, and whitiſh, ſpotted with yellow. Nicobar iſlands. A very rare ſpecies.

lima. 33. C. gibbous, with prickly ribs; anterior ones with recurved, membranaceous tubercles, crenated at the ſides. Nicobar iſlands.

ringens. 34. C. rounded, ventricoſe, white, with deep teeth on the margin; anterior ones roſy. Africa and America.

papyraceum. 35. C. pellucid, cinereous, with thin longitudinal ſtriæ. India.

æolicum. 36. C. thick, with longitudinal anterior ſtriæ, and tranſverſe poſterior ones. Guinea, Antilles iſlands.

oblongum. 37. C. yellowiſh, oblong, turgid, ribbed; anterior parts glabrous; margin notched; three inches long, two and a half broad, ribs about 30. Mediterranean.

craſſum. 38. C. browniſh, rather oblong, thick, antiquated, with deeper teeth on the margin; ribs about 23. Mediterranean and North ſeas.

latum. 39. C. broad, unequal ſided, within white; ribs flat and ſpinulous; two inches long, two and a half broad. Tranquebar and Nicobar iſlands.

pigmeum. * 40. C. ſomewhat heart-ſhaped, ſubangular; grooves imbricated, or beſet with recurved ſcales. Falmouth, Sandwich.

maculatum. 41. C. with crowded, undulated wrinkles; ribs broad, grooves narrow; three inches long, three and one-fourth broad. Bay of Campeachy.

flexuoſum. 42. C. rounded, brown; ribs flexuous, grooves wrinkled; 1¾ inch long, and about the ſame breadth.

fluviatile. * 43. C. flattiſh, thick, white, with flat ribs. Mouth of the Tees, England. Rare.

gaditanum. 44. C. rounded, yellowiſh-white, varied with red, green, and brown, and marked with decuſſated ſtriæ. Cadiz.

braſilenſe. 45. C. rounded; ribs flat, broad, finely notched. Brazil.

amboinenſe. 46. C. rather oblong, white, with blackiſh ſpots; ribs about 12, very convex; 1¼ inches long.

ſquamoſum. 47. C. heart-ſhaped, equilateral, tawny white and purpliſh within; ribs with imbricated ſcales.

cancellatum. 48. C. reddiſh, thin, rounded, with decuſſated ſtriæ.

rubiginoſum. 49. C. reddiſh, unequal ſided; ribs convex, tranſverſely ſtriated.

albidum. 50. C. unequal-ſided, ribbed, whitiſh, within purple; minute.

vireſcens. 51. C. inequilateral, oblong, with fine ribs doubled above.

faſciatum. 52. C. rounded, whitiſh, with a brown band; ribs acute.

Gen. 8. Mactra.

31 Mactra.

Gen. Char.—The animal is a tethys; the ſhell is bivalve, unequal ſided and equivalve; the middle tooth of the hinge is complicated, with a ſmall hollow on each ſide; the lateral ones are remote, and inſerted into each other.

Species.

ſpengleri. 1. M. ſmooth, with a flat, anterior margin, on which is a lunated cape, 3½ inches broad. Cape of Good Hope.

plicatoria. 2. M. with tranſverſe, wrinkled plaits, diaphanous; anterior margin flattiſh, ſhell thin like paper; from 1 to 2 inches long, 2½ broad. Indian ocean.

papyracea. 3. M. thin, pellucid, white, convex; fore-part a little gaping, finely ſtriated and ribbed. Nicobar iſlands. Very rare.

ſtriatula. 4. M. ſmooth, diaphanous; back ſubſtriated, with a ſmooth marginal impreſſion before them, ſurrounded with a rim; 2½ inches long, 3 broad. Mediterranean and Coromandel coaſts.

ſtriata. 5. M. triangular, thick, with ſtrong, thick crowded, arched ſtriæ.

rotundata. 6. M. obtuſely triangular, whitiſh, with milk-white bands on the beaks; margins on each ſide the beaks violet; 1¾ inch long, and nearly 2 broad. Mediterranean.

glabrata. 7. M. ſmooth, diaphanous, ſtriated; beaks ſmooth, margins on each ſide of them ſtriated; 1½ inch long and 2 broad. African and Indian oceans.

nitida. 8. M. ſnowy, gloſſy, thick, diaphanous, ſmooth; depreſſions on each ſide the beaks ſtriated.

corallina. 9. M. ſmooth, ſubdiaphanous, white, with paler bands; 2 inches broad, 1½ long. Mediterranean and Guinea.

lactea. 10. M. thin, turgid, pellucid white; fore-part finely ſtriated, with paler bands. Indian ocean.

ſtultorum. * 11. M. ſemitranſparent, ſmooth, gloſſy, obſoletely radiated, white without, purpliſh within; ſides nearly equal; length 1½ inch, breadth 1¾. European and American ſeas, England, and ſhores of Scotland.

grandis. 12. M. ſemitranſparent, ſmooth, fawn colour with pale rays; beak and hinge placed beyond the middle; 2½ inches long, 3¼ broad.

ſolida. * 13. M. ſtrong, ſubtriangular, of a yellowiſh-white colour, with a few concentric ridges; equal-ſided; 1½ inch long, 1¾ broad. Common on European ſhores, and alſo in Britain.

lutraria. * 14. M. oval, oblong, ſmooth, with irregular concentric ſtriæ; inſide gloſſy white, gaping a little at both ends. Europe, near the mouths of rivers. Found very large on the coaſt of Caermarthen, and ſome parts of Cornwall.—The animal which inhabits this ſhell, according to Montagu, is an aſcidia; and he obſerves 'that it frequently protrudes not leſs than 7 or 8 inches from the ſmaller end in ſearch of food. *Teſt. 'Brit.* p. 100.

cygnus. 15. M. three-ſided, finely ſtriated tranſverſely; fore-part flattiſh and ſlightly wrinkled; 1 inch long and rather broader. Tranquebar.

macula. 16. M. obtuſely triangular, ſmooth, thin, with pellucid cheſnut ſpots; within white, and finely ſtriated; a heart-ſhaped impreſſion behind the beaks; $1\frac{1}{2}$ inch long, and rather broader.

turgida. 17. M. inflated, faintly ſtriated, ochraceous and white within; hinge with a ſupernumerary, triangular, double tooth; $2\frac{1}{4}$ inches long, $3\frac{1}{2}$ broad. Tranquebar.

violacea. 18. M. thin, obſoletely radiated, finely ſtriated tranſverſely; margins on each ſide the beaks whitiſh; 2 inches long and 3 broad. Tranquebar.

cuneata. 19. M. wedge-ſhaped, blue, with fine tranſverſe ſtriæ; margin notched within; 1 inch long and ſcarcely ſo broad.

glauca. 20. M. ovate, dirty white with glaucous rays, and fine tranſverſe ſtriæ; $2\frac{1}{4}$ inches long, $3\frac{1}{2}$ broad. Mediterranean.

pellucida. 21. M. ovate, thin, pellucid, white, with unequal tranſverſe ſtriæ; $1\frac{1}{4}$ inch long, and 2 broad. Guinea.

fragilis. 22. M. ovate, thin, ſmooth, pellucid, flattiſh; anterior gape tranſverſely ſtriated, and wrinkled. Nicobar iſlands.

rugoſa. 23. M. ovate, dirty white, with elevated longitudinal ſtriæ; croſſing the tranſverſe ones, which are a little more raiſed; $2\frac{1}{2}$ inches long, $2\frac{1}{4}$ broad; thick, and white within.

nicobarica. 24. M. ovate, thin, pellucid, ſmooth on the fore-part; the hind-part with cancellated ſtriæ. Nicobar iſlands.

complanata. 25. M. ovate, thin, with arched plates; the plates tranſverſely ſtriated; no lateral teeth; 1 inch long, $2\frac{1}{2}$ broad. India.

liſteri. * 26. M. very thin, nearly round, whitiſh; hinge with a triangular tooth, and large cavity; $1\frac{1}{2}$ inch long, and 2 broad. Common on the ſhores of Britain. *Mactra compreſſa*, Montagu, *Teſt. Brit.* p. 96.

piperita. 27. M. ovate, compreſſed, tranſverſely ſtriated; hinge teeth very minute, with a large oblique hollow. Mediterranean.

32 Donax.

Gen. 9: DONAX, or *Wedge-ſhell.*

Gen. Char.—The animal is a tethys. The ſhell is bivalve, with generally a crenulate margin; the anterior margin very obtuſe; hinge with two teeth, and a ſingle marginal one placed a little behind; rarely double, or triple.

SPECIES.

ſcortum. 1. D. triangular, heart-ſhaped, with a flat frontal margin. Indian ocean.

pubeſcens. 2. D. ciliated with ſpines on the anterior margin. Indian ocean.

rugoſa. 3. D. wrinkled and gibbous before, with notched margins. Mediterranean and Atlantic ſeas.

trunculus. * 4. D. oblong, ſmooth, gloſſy, finely ſtriated longitudinally; margin crenated; an inch broad. European coaſts, Wales.

ſtriata. 5. D. obtuſe before, ſtriated, the margin denticulated. Southern Europe.

denticulata. * 6. D. obtuſe in front; lips tranſverſely wrinkled; finely ſtriated longitudinally; margin denticulated. European and American ſeas; ſhores of Britain, but rare.

cuneata. 7. D. wedge-ſhaped, margins very entire; 1 inch long, $1\frac{1}{4}$ broad. Tranquebar.

faba. 8. D. gibbous, finely ſtriated tranſverſely, ſpotted with yellow.

ſcripta. 9. D. ovate, compreſſed, ſmooth, marked with purple waved lines; margins crenulate. Malabar coaſts.

muricata. 10. D. ovate, ſtriæ muricated; margin denticulated. Indian ocean.

irus. * 11. D. oval, with tranſverſe, waved, erect, ſtriated, membranaceous wrinkles; ſize of a ſmall kidney bean. Mediterranean, ſhores of Devonſhire and Cornwall, where it is found in the hardeſt limeſtone.

lævigata. 12. D. obtuſe before, obſoletely ſtriated at the ſides; margin very entire; hinge without marginal teeth; $1\frac{1}{2}$ inch long, 2 inches broad. Tranquebar.

ſpinoſa. 13. D. hind-part ſmooth and perpendicularly ſtriated; fore-part truncated, and finely cancellated; angles ſpinous. Tranquebar. Very rare.

incarnata. 14. D. fleſh-coloured, anterior part truncated, wrinkled, and marked with reticulated ſtriæ; hind-part wedge-ſhaped, and furrowed with fine perpendicular ſtriæ. Tranquebar.

argentea. 15. D. oval, ſmooth, olive-green, within ſilvery; margin with more elevated acute teeth, near the hinge.

bicolor. 16. D. ovate with elevated ſtriæ croſſing a few tranſverſe ones; rufous with a white ray on one ſide.

radiata. 17. D. brown, with hyaline ſpots; outſide with crowded, arched, tranſverſe ſtriæ; inſide with perpendicular ones; 1 inch broad, $1\frac{1}{4}$ long. Tranquebar.

ſtraminea. 18. D. with thin perpendicular ſtriæ, croſſing the tranſverſe ribs on the fore-part; ſtraw colour, with darker tranſverſe bands; margin tawney and entire behind; 1 inch long, $\frac{1}{4}$ broad.

candida. 19. D. entirely white, with a few thin, arched, tranſverſe ſtriæ, which are oblique towards the rim; hinge with three oblique middle teeth; margin entire; 1 inch long, and ſomething broader.

complanata. * 20. D. oblong, ſmooth, gloſſy, light yellow, with ſmall ſpots or ſtreaks of white, and one broad ray of the ſame from the back to the oppoſite margin; $\frac{5}{8}$ inch long, $\frac{1}{2}$ broad. Devonſhire, but rare. Montagu, *Teſt. Brit.* p. 106.

plebeia. * 21. D. oblong, ſuboval, ſmooth, gloſſy, commonly marked with two brown ſtripes longitudinally from the beak; margin ſmooth; ſcarcely $\frac{1}{2}$ inch long, $\frac{3}{4}$ broad. Weymouth, Dorſetſhire. Montagu, *Teſt. Brit.* 107.

33 Venus.

Gen. 10. VENUS.

Gen. Char.—The animal a tethys; ſhell bivalve, frontal margin flattened, with incumbent lips; hinge with three teeth, all of them approximate; the lateral ones divergent at the tip.

SPECIES.

Species.

A. *Shell ſomewhat heart-ſhaped.*

dione. 1. V. tranſverſely grooved, with a double row of ſpines on the flattened ſide. American ocean. This ſhell is very rare.

paphia. * 2. V. ſomewhat heart-ſhaped, with thickened wrinkles; flattened ſide with attenuated wrinkles; lips complicated; 2 inches long, $1\frac{1}{4}$ broad. American iſlands, Cornwall.

marica. 3. V. heart-ſhaped, with decuſſated ſtriæ, flattened margin, lamellated. American ocean. Very rare.

diſera. 4. V. ſomewhat heart-ſhaped, with tranſverſe, remote, reflected grooves; margin crenulated. American ocean. Very rare.

bajana. 5. V. brittle, glabrous, with a few tranſverſe ſtriæ. Brazil.

excavata. 6. V. lentiform, tranſverſely ſtriated, with a deep, heart-ſhaped depreſſion behind the beaks; flat ſide, broad.

verrucoſa. * 7. V. with membranaceous, tranſverſe, ſtriated grooves, forming tubercles towards the outer margin; margin crenulated; 2 inches long, 2 broad. Mediterranean, Antilles iſlands, Cornwall.

lapicida. 8. V. longitudinally ſtriated forwards, and tranſverſely backwards. American iſlands.

divergens. 9. V. white, with fine, crowded, divergent ſtriæ. American iſlands.

caſſina. 10. V. with tranſverſe, recurved, acute grooves; poſterior margin crenated, and grooved behind the beaks. European ſeas. It is often found in a foſſil ſtate.

cancellata. 11. V. with tranſverſe, membranaceous, remote ſtriæ, and a heart-ſhaped depreſſion behind the beaks; 1 inch long, $1\frac{1}{2}$ broad. Indian ocean.

gallina. * 12. V. radiate, with tranſverſe, obtuſe ſtriæ; hind tooth of the hinge minute; margin crenulated; 1 inch long, $1\frac{1}{4}$ broad. American and European ſeas, Cornwall.

guineenſis. 13. V. with tranſverſe, acute ſtriæ; lips finely ſtriated and roſy; margin very entire. Africa.

petulca. 14. V. ſlightly grooved, margin crenated; ſize of a hazel-nut. South of Europe.

flexuoſa. 15. V. grooves obtuſe, tranſverſe; lips of the anterior margin with an elevated angle; 1 inch long, $1\frac{1}{4}$ broad. American and Indian oceans.

erycina. 16. V. grooves tranſverſe, parallel, obtuſe; anterior margin glabrous; depreſſion behind the beaks ovate; $2\frac{1}{2}$ inches long, 3 broad. India.

mercenaria. 17. V. ſtrong and thick, with ſlight tranſverſe ſtriæ, and covered with a brown cuticle; within, pale violet; margin crenated; 3 inches long, and nearly 3 broad. Europe, North America. Shells of this ſpecies are found foſſil in the mountains of Sweden. In North America they are called *clams*, and the Indians make wampum or money of them.

elandica. * 18. V. thick and ſtrong, with ſlight tranſverſe ſtriæ, and covered with a brown cuticle; within pure white, and ſmooth; margin entire; $3\frac{1}{2}$ inches long, 4 broad. Europe, Africa, Caſpian ſea, Caermarthenſhire, and ſhores of Scotland. The fiſh is employed as food by the Icelanders.

chione. * 19. V. ſmooth, with fine tranſverſe wrinkles; margin entire; hind tooth of the hinge lanceolate; 3 inches long, $3\frac{1}{4}$ broad. Aſiatic ſeas; Cornwall, where this ſpecies is called *queen*.

maculata. 20. V. ſmooth, with a few faint ſpots; $1\frac{1}{4}$ inch long, $2\frac{1}{2}$ broad. American ocean.

meretrix. 21. V. glabrous, with a brown gibbous ſlope before, and gaping membranes; margin entire. Near the mouths of rivers, Indian ocean.

læta. 22. V. ſmooth, radiated with white; lips of the anterior ſlope violet; $1\frac{1}{2}$ inch long, $1\frac{1}{2}$ broad. Mediterranean and Indian ſeas.

caſtrenſis. 23. V. triangular, rounded, gibbous, ſmooth, and marked with angular characters; $1\frac{1}{2}$ inch long, 2 broad. Indian ocean, Red ſea.

phryne. 24. V. ſmooth, tranſverſely ſtriated before and behind; poſterior ſlope obcordate, with violet veins. Southern ocean.

meroe. 25. V. ovate, compreſſed, tranſverſely ſtriated, with a gaping ſuture behind; $1\frac{1}{2}$ inch long, $2\frac{1}{2}$ broad. American and Indian ocean.

minuta. 26. V. ſubovate, tranſverſely ſtriated, and ſubpellucid; membranes cloſed; from 1 to 2 inches broad, $1\frac{1}{2}$ long. Iceland.

deflorata. * 27. V. oval, longitudinally wrinkled, ſemipellucid, faintly radiated with purple and white; $1\frac{1}{4}$ inch long, $1\frac{3}{4}$ broad. European and American ſeas, Falmouth.

fimbriata. 28. V. oval, gibbous, longitudinally ſtriated, and tranſverſely grooved; margin crenated; 2 inches long, 3 broad. Eaſt Indies.

reticulata. 29. V. ſtriæ elevated, decuſſated; heart-ſhaped depreſſion behind; margin entire; 2 inches long, $2\frac{1}{2}$ broad. India.

ſquamoſa. 30. V. ſtriæ reticulated, and ſcaly on the back part. India.

puerpera. 31. V. roundiſh, with decuſſated, membranaceous ſtriæ; lips flexuous. India.

tripla. 32. V. triangular, ſmooth, retuſe behind and before; 1 inch long, and rather broader. Mediterranean.

plicata. 33. V. with arched, membranaceous, tranſverſe ſtriæ; poſterior ſlope reddiſh, heart-ſhaped; lips oblique. Indian ſeas. Very rare.

rugoſa. 34. V. gibbous, with tranſverſe, membranaceous, arched ſtriæ; poſterior ſlope heart-ſhaped; margin crenated; 2 inches long, 2 broad. India.

caliſte. 35. V. with tranſverſe, acute ſtriæ, anteriorly membranaceous; anterior ſlope ſhort, poſterior indiſtinct. Red ſea.

granulata. 36. V. rounded, with decuſſated ſtriæ; fore-part and crenated margin violet. American ocean.

imbricata. 37. V. with perpendicular, imbricated ribs, tranſverſely ſtriated; margin crenated. It has been found in a foſſil ſtate in France.

divaricata. 38. V. with fine tranſverſe ſtriæ, croſſing ſome diverging longitudinal ones towards the margin; poſterior impreſſion ovate; margin crenated. E. Indies.

contraria. 39. V. oblong, flattiſh, tranſverſe ſtriæ running contrary behind; margin crenated. Guinea.

gallus. 40. V. oblong, ovate, radiated, with thick, crowded, tranſverſe ſtriæ; anterior ſlope broad, ovate; poſterior impreſſion heart-ſhaped; $1\frac{1}{2}$ inch long, 2 broad. Malabar.

flammea. 41. V. tranſverſely ſtriated, the back glabrous; anterior ſlope broad, with brown lines; poſterior impreſſions heart-ſhaped, with brown lines. Red ſea.

corbicula. 42. V. triangular, ſmooth, truncated on each ſide, with yellowiſh rays; ſlopes heart-ſhaped; margin very entire. Atlantic and American ſeas. Rare.

ſinuoſa. * 43. V. thin, convex, ſomewhat triangular, with a deep obtuſe ſinus in the middle of the front. Britain.

hermaphrodita. 44. V. triangular, very ſmooth, olive coloured, obſcurely banded: anterior ſlope heart-ſhaped; poſterior ovate. Rivers of Guinea. Rare.

coaxans. 45. V. green, within white, with tranſverſe, unequal, membranaceous ſtriæ; margin acute; $2\frac{1}{2}$ inches long, 3 broad. Rivers of Ceylon.

caſta. 46. V. gibbous, ſnowy; anterior part convex; within pale violet; anterior ſlope roundiſh, poſterior heart-ſhaped; margin very entire. India.

affinis. 47. V. thin, glabrous, convex; white variegated with brown; poſterior ſlope elongated, with oblique tumid lips; four teeth in the hinge. Mauritius.

opima. 48. V. thick, convex; anterior ſlope ovate, poſterior heart-ſhaped; hinge with three teeth. India.

triradiata. 49. V. convex, gray, with three blackiſh blue rays; poſterior ſlope elongated; lips tumid. Tranquebar.

nebuloſa. 50. V. ochraceous, with cinereous and bluiſh ſpots; anterior ſlope oval; poſterior ſlope ovate, bluiſh. Tranquebar.

contempta. 51. V. thick, triangular, equilateral, ſmooth; beaks convergent; primary tooth of the hinge crenulated: minute. Malabar.

japonica. 52. V. oblong, ovate, inequilateral; lid tranſverſe; ſtriæ crowded at the ſides; poſterior ſlope oblong, ovate. Japan.

ſtriata. 53. V. ventricoſe, anteriorly angular, with tranſverſe, thick, ſmooth and ſlightly arched ſtriæ: poſterior ſlope heart-ſhaped. India. Rare.

textilis. 54. V. oval, quite ſmooth, inequilateral; ſlopes oblong; margin very entire; $1\frac{1}{4}$ inch long, $2\frac{1}{4}$ broad. Malabar, Red ſea.

corrugata. 55. V. ovate, whitiſh; ſtriæ tranſverſe, anteriorly thick and ſtrong, poſteriorly thin and undulating. Mediterranean.

monſtroſa. 56. V. ovate, whitiſh; ſtriæ decuſſated; hinge with only two teeth in the left valve. Nicobar iſlands.

ponderoſa. 57. V. ſolid, weighty, inequilateral, wrinkled on both ſides; margin crenulated; hinge with two teeth. Southern ocean.

ſubviridis. 58. V. greeniſh, glabrous, thick: margin entire, beaks prominent.

roſtrata. 59. V. ovate; ſtriæ perpendicular, ſcaly, croſſing the tranſverſe ones.

fuſca. 60. V. brown, with fine, perpendicular ſtriæ; $1\frac{1}{4}$ inch long, $2\frac{1}{2}$ broad.

luſitanica. 61. V. oblong, with fine tranſverſe ſtriæ; margin crenated. Seas round Portugal.

punctulata. 62. V. ovate, white, with bay lines, and yellowiſh dots. Corſica.

faſciata. 63. V. round, ſmooth, with bay and yellowiſh rays, partly blue, and partly livid.

carnea. 64. V. oval, inequilateral, ſlightly wrinkled, fleſh-coloured, with three rays; $1\frac{1}{2}$ inch long, $2\frac{1}{2}$ broad.

virgata. 65. V. externally ſteel blue, with yellow rays; internally violet. Indian ocean.

verſicolor. 66. V. oval, obliquely ſtriated, whitiſh; rays white, tawny, bluiſh and red.

variegata. 67. V. ovate, inequilateral, finely ſtriated and dotted with blue: rays browniſh and black.

amethyſtina. 68. V. ovate, violet; ſtriæ perpendicular; $1\frac{3}{4}$ inch long, $2\frac{1}{2}$ broad.

callipyga. 69. V. poſteriorly ovate, tranſverſely and unequally ſtriated, and marked with angular lines. Shores of Liſbon.

ſenegalenſis. 70. V. ovate, with fine decuſſated ſtriæ; white or fleſh-coloured, varied with brown; $1\frac{1}{2}$ inch broad, not one inch long. Senegal.

matadoa. 71. V. triangular, white or yellow, with about 40 tranſverſe parallel grooves; $1\frac{1}{2}$ inch long. Senegal.

ſuccincta. 72. V. heart-ſhaped, with tranſverſe, remote, excavated grooves; margin crenulated.

compreſſa. 73. V. heart-ſhaped, much compreſſed, tranſverſely grooved.

auſtralis. 74. V. heart-ſhaped, poliſhed, white, marked with browniſh characters; margin entire. Southern ocean.

gigantea. 75. V. ovate, livid, with numerous, interrupted, bluiſh rays; poſterior ſlope ovate. Shores of Ceylon and Florida.

B. *Orbicular.*

tigerina. * 76. V. lentiform, with crenated, decuſſated ſtriæ; poſterior ſlope impreſſed, ovate. American and Indian ocean, ſhores of Weymouth.

proſtrata. 77. V. orbicular, tranſverſely ſtriated, with rough, membranaceous lips; two inches long, not ſo broad. Coromandel.

penſylvanica. 78. V. lentiform, with glabrous wrinkles, white with a longitudinal groove anteriorly on each ſide; 2 inches long. America.

ſpuria. 79. V. white, ſomewhat glabrous, with a longitudinal groove anteriorly, and hinge without lateral teeth. Shores of Iceland and Ferro iſlands.

incruſtata. 80. V. lentiform, glabrous, ſmooth, with excavated dots. India.

punctata. 81. V. lentiform, longitudinally grooved, dotted within; 2 inches long, $2\frac{1}{2}$ broad. India, but rare.

exoleta. * 82. V. lentiform, tranſverſely ſtriated, pale, with obſolete rays; poſterior ſlope heart-ſhaped: 2 inches long, and 2 broad. Norway, and coaſt of Britain, Cornwall.

undata. * 83. V. thin, convex, orbicular, whitiſh, tinged with yellow, with thin, tranſverſe ſtriæ; margins waved. Britiſh ſeas, Falmouth.

tumidula. 84. V. gibbous with tranſverſe, remote, rather obſolete grooves; margin entire.

ſinenſis. 85. V. longitudinally ſtriated, with tranſverſe, white, and violet arches; margin interiorly crenated. Chineſe ſhores.

ſinuata. 86. V. lentiform, tranſverſely ſtriated, with an oblong gaping vent on the anterior ſlope; hinge with 4 teeth. Nicobar iſlands.

borealis. * 87. V. lentiform, with remote, tranſverſe, membranaceous ſtriæ; $1\frac{1}{2}$ inch long, 2 broad. European ſeas, Britain.

pectinata. 88. V. ſublentiform, with wrinkled, longitudinal grooves, branched near the anterior margin; $1\frac{1}{2}$ inch long, 2 broad. Indian and American oceans.

ſcripta. 89. V. lentiform, compreſſed, ſtriated, angular; the hinder angle ſtraight. Indian ocean, and Red ſea. Very rare.

dentula. 90. V. ſubglobular, lenticular, wrinkled, without teeth; poſterior ſlope ovate. American ocean.

cincta. 91. V. very convex, and ſurrounded with rings; intermediate grooves crenated; poſterior ſlope heart-ſhape; margin crenulated. A minute ſhell.

concentrica. 92. V. white, ſub-orbicular, compreſſed, with concentric ſtriæ; margin very entire; poſterior ſlope heart-ſhaped. Atlantic and American ſeas. A large ſhell.

iuvenilis. 93. V. lentiform, with tranſverſe, crowded ſtriæ; anteriorly circular, and terminating in wrinkles behind; poſterior ſlope heart-ſhaped; margin very entire. India.

hiſtrio. 94. V. lentiform, with tranſverſe, acute, arched ſtriæ; margin entire; poſterior ſlope heart-ſhaped. India. Rare.

globoſa. 95. V. globular, with fine tranſverſe ſtriæ; margin very entire; hinge with two teeth; 1 inch long, $1\frac{1}{2}$ broad. Red ſea. Very rare.

pectunculus. 96. V. orbicular, equilateral, tranſverſely wrinkled, and variegated with rufous. Japan.

albida. 97. V. orbicular, ſub-compreſſed, equilateral, white, with fine tranſverſe ſtriæ. Jamaica.

campeachienſis. 98. V. orbicular, inequilateral, with crowded, acute, tranſverſe ſtriæ; $1\frac{1}{2}$ inches long. Bay of Campeachy.

craſſa. 99. V. orbicular, ſolid, compreſſed, with fine tranſverſe ſtriæ, and red rays.

purpuraſcens. 100. V. orbicular, with fine tranſverſe ſtriæ, and purpliſh rays.

rubra. 101. V. orbicular, inequilateral, cheſnut with darker rays, and crowded, thick, tranſverſe ſtriæ. Jamaica.

violacea. 102. V. with perpendicular ſcaly ſtriæ; margin denticulated, violet within.

ſpadicea. 103. V. ſtriæ perpendicular, and ſcaly towards the margin; colour cheſnut; 2 inches long, $2\frac{1}{2}$ broad.

cancellata. 104. V. ſub-rufous, cancellated; a minute ſhell.

bengalenſis. 105. V. orbicular, nearly equilateral, with thick, perpendicular ſtriæ; beaks turned back. Bengal.

aurea. * 106. V. ſub-orbicular, inequilateral, tranſverſely ſtriated, and marked with faint longitudinal ſtriæ: 1 inch long, $1\frac{1}{5}$ broad. Dorſetſhire.

obſcura. 107. V. brown, with thin perpendicular ſtriæ; 1^{1} inch long, $2\frac{1}{2}$ broad.

purpurata. 108. V. orbicular, ſub-equilateral, perpendicularly wrinkled, and with purple rays; $1\frac{1}{2}$ inch long, $1\frac{3}{4}$ broad.

nux. 109. V. lentiform, teſtaceous, wrinkled; poſterior ſlope heart-ſhaped. Ionian ſhores.

rugata. 110. V. orbicular, teſtaceous, ſub-equilateral, with diſtant tranſverſe wrinkles.

gibbula. 111. V. lentiform, tranſverſely ſtriated, anteriorly truncated.

ſtellata. 112. V. orbicular, ſmooth, golden, with a white ſtar at the beak. Liſbon.

italica. 113. V. orbicular, pale yellow, with elevated, tranſverſe, diſtant ſtriæ. Mediterranean.

braziliana. 114. V. lentiform, yellowiſh brown, with thin, tranſverſe, diſtant ſtriæ; poſterior ſlope heart-ſhaped, bluiſh; anterior ſlope broad, bluiſh. Brazil.

pellucida. 115. V. orbicular, pellucid, ſmooth; anterior ſlope pale golden, with cheſnut ſpots; poſterior ſlope heart-ſhaped, with red and green veins. Brazil.

holoſericea. 116. V. orbicular, ſolid, white, with undulated, golden ſtriæ, and a broad yellow band towards the margin, variegated with tranſverſe brown lines.

117. V. orbicular, ventricoſe, thick, browniſh, radiated with white; ſtriæ annular. Macaſſar. *macaſſarica.*

118. V. ſub-orbicular, of an orange colour; 2 inches long, $2\frac{1}{2}$ broad. *aurantia.*

119. V. lentiform, fulvous, with fine circular ſtriæ. *fulva.*

120. V. orbicular, white, with reticulated ſtriæ. *candida.*

121. V. orbicular, tranſverſely ſtriated, whitiſh, with brown ſpots, lines, and angular characters. *albicans.*

122. V. ſub-orbicular, tranſverſely ſtriated, white, with reddiſh undulated lines and dots. *undulata.*

123. V. orbicular, equilateral, white, with fine tranſverſe ſtriæ, thicker towards the margin. *lineata.*

124. V. ſmooth, nearly equilateral, whitiſh. *lævis.*

125. V. orbicular, ſmooth, inequilateral, livid horn-colour, with a white, tranſverſe line. *cornea.*

126. V. orbicular, fulvid, dotted with white at the margin. *guttata.*

127. V. inequilateral, reddiſh, ſmooth, with a few tranſverſe lines. *rufeſcens.*

128. V. lentiform, ſtriæ cancellated and radiated; margin crenulated; greeniſh, with darker ſpots. *virens.*

129. V. white, with radiated ſpots and arched ſtriæ; in the middle a large gray ſpot, tapering upwards. *maculoſa.*

130. V. entirely of a fleſh colour, with longitudinal ribs croſſing the remote tranſverſe wrinkles; $1\frac{1}{2}$ inch long, $1\frac{1}{2}$ broad. *coſtata.*

131. V. thin, convex, with fine tranſverſe ſtriæ; within ſnowy, without marked with the letter *W*, and many ſcattered dotes: beaks inflated. *wauaria.*

132. V. tumid, ſolid, ſmooth; with a few tranſverſe wrinkles towards the margin; hinge with 4 teeth in each valve; $1\frac{3}{4}$ inches long, 2 broad. Africa. *tumens.*

133. V. thin, orbicular, pellucid, ſmooth, ſnowy; hinge with two teeth in each valve; $1\frac{1}{2}$ inch diameter. Weſtern ſhores of Africa. *diaphana.*

134. V. ſub-orbiculate, compreſſed, hard, tranſverſely grooved, reddiſh, with brown rays; 6 inches broad, $4\frac{1}{2}$ long. *dura.*

135. V. orbicular, compreſſed, ſnowy, with longitudinal rounded grooves, croſſed with tranſverſe ſtriæ; 9 lines in diameter. Africa. *eburnea.*

136. V. tranſparent, pale, fulvous within and without, with fine longitudinal grooves; 16 lines long. Africa. *lucida.*

137. V. orbicular, a little convex, with longitudinal ſtriæ perpendicular in the middle, obliquely divergent towards the outſide, and croſſed by tranſverſe ones; intermediate grooves and inner margin crenated. *diſcors.*

138. V. orbicular, ſub-equilateral, with elevated, acute, tuberculated ribs; margin denticulated, and crenated. *aculeata.*

C. *Oval, a little angular near the beaks.*

* 139. V. ovate, anteriorly angular, with undulated tranſverſe ſtriæ; 2 inches long, $2\frac{1}{2}$ broad. Europe and India, coaſt of Britain. *literata.*

140. V. Inequilateral, thin, with fine decuſſated ſtriæ; white, reticulated with brown. Mediterranean. *geographica.*

141. V. ovate, anteriorly angular, with tranſverſe ſtriæ; intermediate tooth of the hinge bifid; $1\frac{1}{2}$ inch long, 3 broad. Indian ocean. Rare. *rotundata.*

* 142. V. ovate, with decuſſated ſtriæ anteriorly angular; $1\frac{1}{2}$ inch long, 2 broad. Mediterranean, Britiſh coaſts. *decuſſata.*

virginea. 142. V. ſubovate, anteriorly ſubangular, with unequal, tranſverſe ſtriæ; anterior ſlope tumid. Adriatic.

virginica. 143. V. ovate, tranſverſely wrinkled; 1 inch long, 1½ broad. Virginia.

rhomboides. * 144. V. depreſſed or rhomboid, with concentric ſtriæ; pale brown, variegated; ¼ inch long, 1¼ broad. Britiſh coaſts.

cruentata. 145. V. ovate, inequilateral, tranſverſely ſtriated and ſpotted with red.

luteſcens. 146. V. ovate, tranſverſely ſtriated; outwardly radiated and marked towards the margin with characters, lines and ſpots; within yellowiſh.

ſanguinolenta. 147. V. oval, ſmooth, yellowiſh, with red ſpots and dots; 1¼ inch long, 1¼ broad. Shores of Naples.

argentea. 148. V. oblongiſh, ſmooth, ſilvery, with black lines united into bands. Shores of Cadiz.

donacina. 149. V. oblongiſh, flattened, anteriorly tranſverſely grooved; internal margin crenulated; ſlopes linear, excavated; 1¼ inch long, 1¾ broad.

afra. 150. V. grooved, umbo pointed; poſterior ſlope wrinkled and heart-ſhaped; grooves fine, about 130; 1 inch broad. Africa.

dealbata. 151. V. oblong, thin, flattened, bluiſh when the fiſh is alive, and ſnowy when it is dead; 1½ inch broad, ¼ long. Africa.

lithophaga. 152. V. ovate, reticulated, gaping on each ſide; hinge with 2 teeth, alternately bifid. Shores of Croatia, among rocks and ſtones.

34
Spondylus.

Gen. 11. SPONDYLUS.

Gen. Char.—The animal a tethys; ſhell hard, ſolid, with unequal valves, one of them convex, the other rather flat; hinge with two recurved teeth, ſeparated by a ſmall hollow.

SPECIES.

gædaropus. 1. S. ſlightly eared and ſpinous. Mediterranean, Indian, and other ſeas.—This ſpecies varies greatly in ſize, thickneſs, and colours. Sometimes it is entirely purple, orange, white or bloom colour, and ſometimes it is marked with various ſtreaks, ſpots, dots, or bands.

regius. 2. S. without ears, and ſpinous. In this ſpecies the ſhell is ſub-globular, white within, without purpliſh, ſcarlet, flame colour, orange or white: ſpines generally two inches long, ſometimes cylindrical, with a crenated margin. India, Malta. Very rare.

plicatus. 3. S. without ears or ſpines, plaited. India, America, and the Mediterranean. The ſhell is white, with yellowiſh, reddiſh, browniſh, or violet lines and veins.

citreus. 4. S. oblong, plaited, ſpinous. In this ſpecies the ſhell is imbricated, of a citron colour, or red, with the inner margin orange. It is 2 inches long, 1¾ broad. The whole ſhell is thin and nearly tranſparent.

35
Chama.

Gen. 12. CHAMA, or *Gaping Cockle.*

Gen. Char.—The animal a tethys; the ſhell bivalve, rather coarſe; hinge with a callous gibboſity, obliquely inſerted in an oblique hollow; anterior ſlope cloſed.

SPECIES.

[illegible]r. * 1. C. roundiſh, ſmooth; beaks recurved; anterior ſloped with a gaping ſent. Adriatic and Caſpian ſeas, Hebrides. Sometimes it is found of a large ſize.

gigas. 2. C. plaited, with arched ſcales; poſterior ſlope gaping, with crenulated margins. Indian ocean.—This ſpecies ſometimes meaſures only about an inch in length, but ſometimes it is found to be the largeſt of ſhells, and equal to 532lb. weight. The fiſh which it contains is ſaid to furniſh a meal to 120 men; and its muſcular ſtrength is ſo great as to cut aſunder a cable, or lop off the hand of a man.

hippopus. 3. C. plaited, muricated, poſterior ſlope retuſe, cloſed, toothed; 5 inches long, 7 broad. Indian ocean.

antiquata. 4. C. ſomewhat heart-ſhaped, with longitudinal grooves, and tranſverſe ſtriæ; ribs from 19 to 22. Atlantic and Indian ſeas.

trapezia. 5. C. trapeziform, gibbous, with longitudinal, crenulated grooves; about the ſize of a pea. Norway ſeas.

ſemiorbiculata. 6. C. ſuborbicular, compreſſed, coarſe, with decuſſated ſtriæ.

canaliculata. 7. C. oblong with imbricated grooves; anterior part retuſe; ½ inch long, 1⅔ broad. American and Indian ſeas.

cordata. 8. C. heart-ſhaped, tranſverſely ſtriated; one ſide elongated, compreſſed. Indian and Red ſeas.

ſatiata. 9. C. roundiſh, with toothed grooves, mixed with dots; poſterior ſlope retuſe; heart-ſhaped.

oblonga. 10. C. oblong, fore-part angular, with anterior acute teeth. Shores of Guinea.

lazarus. 11. C. imbricated, with jagged lamellæ; beak a little ſpiral obliquely. India.

gryphoides. 12. C. orbicular, muricated; one valve flatter, the other with a ſub-ſpiral, produced beak. Mediterranean, American, and Indian ſeas.

bicornis. 13. C. with conic valves, and horn-ſhaped, oblique, tubular beaks, longer than the valve. Indian and American ſeas.

arcnella. 14. C. grooved, muricated, with excavated dots; hinge with a ſeſſile callus; 2 inches broad and 2 long. American ocean.

moltkiana. 15. C. obtuſely triangular, equilateral, plaited; anterior ſlope elevated, with oblique plates and ſtriæ: ſize of a hazel nut.

concamerata. 16. C. tranſverſely wrinkled, and longitudinally ſtriated. In the middle of each valve within is an additional chamber. American ocean. Small, whitiſh. Very rare.

macrophylla. 17. C. rounded, with lamellæ diſpoſed in rows; internal margin crenulated. American ocean.

foliacea. 18. C. white, with foliaceous, ſerrated, tranſverſe ſtriæ, the interſtices crenated, beaks recurved. Mediterranean and American ſeas.—This ſpecies is found foſſil in Campania: it is ſometimes round, and ſometimes oblong.

arata. 19. C. rounded, white, and undulated with brown, with triangular, wrinkled, perpendicular ribs: margin unequal. Shores of Syracuſe.

fuſca. 20. C. wrinkled, oblong, narrow, brown; lower valves with a projecting, rounded, ſubincurvated beak.

citrea. 21. C. roundiſh, ventricoſe, inequivalve, muricated, with ſcattered, unequal, ſcaly ſpines. America.—This ſhell is of a citron colour.

thaca. 22. C. roundiſh, longitudinally ſtriated; poſterior ſlope retuſe. Shores of Chili, where it buries itſelf in the ſands. The ſhell is white, violet, and yellow, and within an elegant purple. It is about 4 inches in diameter. The fiſh affords a rich and agreeable food.

rugoſa. 23. C. ſuborbicular, with very deep grooves; wrinkles ſlightly imbricated; margin doubly folded. The grooves are about 30 in number.

gryphica. 24. C. oblique, with a lateral oblique pit, wrinkled; callus of the hinge toothed. Barbary.

corraliophaga. 25. C. cylindrical, white, diaphanous, with decuſſated ſtriæ; the tranſverſe ſtriæ arched and imbricated.

36 Arca.

Gen. 13. Arca, or *Ark-ſhell.*

Gen. Char.—The animal a tethys: The ſhell bivalve, equivalve; the hinge with a number of teeth, ſharp, alternate, and inſerted all along the rim.

Species.

A. *Margin very entire, beaks recurved.*

tortuoſa. 1. A. parallelopiped, deeply ſtriated longitudinally; leſſer valve obliquely carinated. Indian ocean. Very rare.

B. *Margin entire, beak inflected.*

noæ. * 2. A. *Noah's ark;* oblong, ſtriated, and emarginated at the tip; beaks very remote, bent in; margin gaping. Mediterranean and Atlantic ſeas, Cornwall.

barbata. 3. A. oblong, ſtriated, bearded with byſſus; beaks approximate; margin cloſed. Europe and Indian ſeas.

modiolus. 4. A. oblong, ſtriated, anteriorly angular. Mediterranean.

pella. 5. A. ovate, pellucid, ſubſtriated; anterior ſlope diſtinct, prominent; hinge ciliar. Mediterranean.

ovata. 6. A. ovate, with decuſſated ſtriæ, ſnowy, and covered with a ruſſet brown epidermis; margin gaping. Red ſea.

pellucida. 7. A. pellucid, brittle, round at each end, obſoletely ſtriated; teeth of the hinge very ſharp. Nicobar iſlands.

roſtrata. 8. A. convex, with tranſverſe ſtriæ; hind-part rounded, fore-part extended into an acute beak; $1\frac{1}{2}$ inch long, $1\frac{1}{4}$ broad. Baltic and Norway ſeas.

ſtriata. 9. A. lentiform, with numerous decuſſated ſtriæ; lateritious and reddiſh within; poſterior excavation triangular; hinge arched; an inch broad, and ſomething longer. Red ſea.

pulchella. 10. A. roundiſh, biradiated, with tranſverſe ſtriæ.

afra. 11. A. whitiſh, covered with a whiter ſkin, with decuſſated ſtriæ; grooved, and obliquely truncated; from 4 to 5 lines long, and 3 broad. Africa.

foſſilis. 12. A. thick, roundiſh, longitudinally ſtriated, and tranſverſely ribbed; ribs, with undulated ſtriæ; 3 inches long, $3\frac{1}{2}$ broad. Found in a foſſil ſtate in the duchy of Limbourg.

cancellata. 13. A. with cancellated ſtriæ, and bearded; margin gaping in the middle. American ocean.

minuta. * 14. A. a little compreſſed, tranſverſely ſtriated, tapering at the remoter end, and rounded at the oppoſite ones; $2\frac{1}{4}$ lines long, and 4 broad. Greenland ſeas, Sandwich.

C. *Margin crenated; beaks recurved.*

lactea. * 15. A. with a rhomboidal, yellowiſh white ſhell, and obſolete, decuſſated ſtriæ; ſize of a horſe bean. European ſeas, Devonſhire.

nodoloſa. 16. A. oblong, with ſtriated tubercles; beaks incurved, remote; margin entire, cloſed. Denmark.

antiquata. 17. A. obliquely heart-ſhaped, with numerous unarmed grooves. Mediterranean and Indian ſeas.

ſenilis. 18. A. obliquely heart-ſhaped, ſmooth, with grooves; margin plaited; 3 inches long, 4 broad. America, Africa.

granoſa. 19. A. ſlightly heart-ſhaped, with muricated grooves; $1\frac{1}{2}$ inch long, $1\frac{1}{4}$ broad. American and Indian oceans.

corbicula. 20. A. ovate compreſſed; with perpendicular knotty ſtriæ; beaks obtuſe, approximate. Nicobar iſlands.

decuſſata. 21. A. lenticular, with longitudinal ſtriæ, croſſed by faint, tranſverſe ones; anterior ſlope cloſed. American ocean.

æquilatera. 22. A. lenticular, nearly equilateral, perpendicularly ſtriated without and within; white, with cheſnut ſpots. American ocean.

pallens. 23. A. lenticular, a little oblique, with decuſſated ſtriæ; anterior ſlope, with a very narrow vent. Indian and American oceans.

cucullus. 24. A. ventricoſe; ſtriæ decuſſated; anterior ſlope heart-ſhaped; 2 inches long, and 3 broad. Nicobar iſlands.

magellanica. 25. A. rounded on each ſide; cheſnut, and marked with decuſſated ſtriæ; external margin inflected, and repand in the middle; beaks approximate. Straits of Magellan.

reticulata. 26. A. rhomboidal, white, with decuſſated ſtriæ; beaks approximate; anterior ſlope heart-ſhaped.

candida. 27. A. pellucid, rhomboid, with decuſſated ſtriæ; fore-part produced; hind-part truncated. American ocean and African ſhores.

indica. 28. A. inequivalve, ovate, with flat, longitudinal ſtriæ and deep grooves; anterior ſlope heart-ſhaped; $\frac{1}{4}$ inch long, $1\frac{1}{2}$ broad. Indian ocean.

jamaicenſis 29. A. rounded before and truncated behind, with crenated or nodulous perpendicular ribs. Jamaica.

campeachienſis. 30. A. ovate, with broad, crenated, or ſcaly, perpendicular ſtriæ; hinge arched. Campeachy bay and Barbadoes.

lata. 31. A. broad, cancellated, truncated before; flattened ſide heart-ſhaped.

ſenegalenſis. 32. A. ovate, longitudinally grooved, with ſlight tranſverſe wrinkles; white; 8 lines long, 10 broad. Africa.

D. *Margin crenated; beak inflected.*

undata. 33. A. lenticular, without ears, ſmooth, with a plaited margin; 2 inches long, 2 broad. American ocean.

pectunculus. 34. A. lenticular, ſlightly eared, with ſlightly imbricated grooves; margin plaited; $1\frac{1}{2}$ inch long, and ſomething broader. American ocean and Red ſea.

pectinata. 35. A. lenticular, without ears, with ſmooth, longitudinal ſtriæ. American ocean.

glycymeris. * 36. A. ſuborbicular, gibbous, and faintly ſtriated tranſverſely. European and Indian ſeas, Cornwall. *Arca Piloſa, Montagu.*

piloſa. 37. A. ſuborbicular, equilateral, hairy; $1\frac{1}{2}$ inches long, $2\frac{1}{4}$ broad. Aſiatic and American ſeas.

nummaria. 38. A. roundiſh, ſmooth, ſlightly eared, and tranſverſely ſtriated. Mediterranean.

* 39. A.

nucleus. * 39. A. obliquely ovate, ſmoothiſh, with a triangular hinge; ſize of a hazel nut. European ſeas. It is ſometimes found foſſil. Shores of Britain.

rhomboidea. 40. A. entirely white, rhomboid, heart-ſhaped, and ribbed; anterior and dorſal ribs knotty; beaks remote. Indian and American oceans.

marmorata. 41. A. equilateral, thin, flattiſh, with fine decuſſated ſtriæ; beaks approximate; hinge arched. American ocean.

anguloſa. 42. A. ventricoſe, with longitudinal ſtriæ and lines; and angular on one ſide; beaks approximate; hinge arched; brown with a few ſpots. Shores of Africa and American ocean.

ſcapha. 43. A. oblong, much depreſſed, ſtriated; beak ſlightly prominent. Ceylon.

37 Oſtrea. Gen. 14. OSTREA, *Oyſter.*

Gen. Char.—The animal is a tethys; the ſhell bivalve, generally with unequal valves, and ſlightly eared; hinge without teeth, but furniſhed with an ovate hollow, and moſtly lateral, tranſverſe grooves.

SPECIES.

A. Valves furniſhed with ears, and radiated. The SCALLOP.

a. *Equilateral; ears of the valves equal.*

maxima. * 1. O. with 14 or 15 rounded ribs, longitudinally grooved, with fine tranſverſe ſtriæ; 5 inches long, 5½ broad: ears large, with decuſſated ſtriæ; lower valve convex, white, often varied with red bands or ſpots; upper valve flat, reddiſh. Found in large beds in moſt European ſeas, where they are dredged up, pickled, and barrelled for ſale. It is ſaid, that the greateſt quantity is taken after a fall of ſnow. This is the ſhell worn formerly by pilgrims on the hat or coat, as a mark that they had croſſed the ſea for the purpoſe of paying their devotion to the Holy Land; in commemoration of this it is ſtill preſerved in the arms of many families.

jacobæa. * 2. O. with about 14 angular and longitudinally ſtriated rays; upper valves flat, with rounded rays, which are finely ſtriated tranſverſely; lower valve with angular rays, which are ſtriated longitudinally. Ears concave and ſmooth on the upper ſide. European ſeas. Dorſetſhire, but rare.

ziczac. 3. O. with 18 flattened rays; ears finely wrinkled; lower valve convex; rays finely ſtriated tranſverſely; upper valve flat, with about twice as many angular lines as there are rays. American ocean.

ſtriatula. 4. O. with 16 faint rays with tranſverſe membranaceous ſtriæ: margin very entire; valves nearly equally flat. Indian ocean.

minuta. 5. O. with 20 convex rays; lower valve white and very convex; upper valve white, clouded with brown, flatter and plaited. Indian ocean.

pleuronectes. 6. O. equivalve, with 12 doubled rays, and ſmooth on the outſide; 4½ inches long, gaping at each end. Indian ocean.

laurentii. 7. O. upper valve ſub-convex, with very fine perpendicular lines, croſſing very fine, concentric, tranſverſe ſtriæ; lower valve with 48 rays, and 48 ſtriæ within; 2½ inches long, about the ſame breadth. S. America. Rare.

japonica. 8. O. equivalve, a little convex, margined with yellow; upper valve with faint lines croſſing tranſverſe concentric bands, and 48 elevated ſtriæ within; 5½ inches long, about the ſame breadth. Guinea and Japan.

9. O. equivalve, glabrous, with oblong crowded ſtriæ; upper valve more convex, lower flatter than in moſt others. Straits of Magellan. *magellanica.*

10. O. with 9 or 10 rays; the interſtices longitudinally ſtriated: margin repand within. Norway ſeas. *hybrida.*

11. O. nearly equivalve; with 12 convex rays croſſed by crenated ſtriæ; 3¼ inches long, 2½ broad. Indian ocean. *radula.*

12. O. equivalve, flattiſh, with 9 unequal rays, imbricated with ſcales. Red ſea. *imbricata.*

13. O. roundiſh with 9 convex cheſnut rays; ears roundiſh, white with a yellowiſh border; 1¾ inches long, 2 broad. *ſubrotunda*

14. O. nearly equivalve, with 16 convex ſmoothiſh rays, and ſtriated acroſs; 1¼ inches long, 1 inch broad. India. *plica.*

15. O. roundiſh with convex rays, outer ones finely ſtriated longitudinally; margin deeply crenated; ears tranſverſely ſtriated. *crenata.*

16. O. ovate with numerous fine ſtriæ; margin crenated within. *ſinouſia.*

17. O. oblong with ſcaly rays; the interſtices broader, and marked with perpendicular ſtriæ; ears wrinkled perpendicularly. *ſquamoſa.*

18. O. roundiſh, with 18 rays imbricated with ſcales; ears ſtriated tranſverſely; ½ inch long. *dubia.*

* 19. O. with 20 ſmooth rays, the interſtices tranſverſely ſtriated; margin crenated; 2 inches long, and the ſame breadth. Shores of Britain. *ſubruſa.*

20. O. flattened, with 18 ſmooth rays, the interſtices cancellated. *verſicolor.*

21. O. rounded with 5 rays; middle-ſized. *roſea.*

22. O. brown with flat rays which diſappear towards the hinge; lower valve convex, upper flat. Indian ocean. *fuſca.*

23. O. thin, flat, purple, with very minute perpendicular ſtriæ croſſing circular tranſverſe ones; the ſtriæ are elevated within. *tenuis-*

24. O. thin, pale yellow, with thick rays. *lutea.*

25. O. roundiſh, white, with a mixture of ſaffron; the rays convex, and finely and ſharply muricated; 2½ inches long. *muricata.*

26. O. roundiſh, tawny, dotted with white and black; the rays thick. *conſperſa.*

27. O. roundiſh, brown, with black tranſverſe lines and dots; rays convex and knotty. *noduloſa.*

28. O. thin, whitiſh, roſy, with white ſtripes; rays convex. *radiata.*

29. O. oblong, pale yellow, ſpotted with white; beaks varied with white and brown; rays crenated; 2 inches long. *punctata.*

30. O. roundiſh, thin, varied with roſy and whitiſh; rays thick with aculeate ſcales. *aculeata.*

31. O. thin, flat, white, with a ſaffron edge; rays round and broad. *plana.*

32. O. oblong, red, minutely ſtriated. *puſilla.*

33. O. convex on each ſide, yellowiſh within; rays convex. *flaveſcens.*

34. O. roundiſh, deep red, with a white hinge and few ſpots; rays ſmooth. *flabellum.*

35. O. glabrous, reſembling a ſpondylus; but the ears are equal. *ſpondyloides.*

36. O.

violacea. 36. O. flattiſh on each ſide; outſide brown, inſide violet. Mediterranean.

aurantia. 37. O. roundiſh, plaited, and finely ſtriated longitudinally; a white ſemicircular band towards the hinge.

vittata. 38. O. within purple, without alternate brown and red bands; rays convex.

miniata. 39. O. white with confluent red ſpots; rays rough; convex valve, with tranſverſe, criſp lamellæ; $1\frac{1}{2}$ inch long, $1\frac{1}{4}$ broad.

inflata. 40. O. convex on each ſide; cloſed, oblong, pellucid; 32 rays; twice as long as it is broad. A rare ſhell.

b. *Ears unequal; one of them generally ciliated, with ſpines within.*

pallium. 41. O. *Ducal mantle.* Equivalve, with 12 convex rays, ſtriated, rough, and imbricated with ſcales; red, varied with brown and white; ears ſtriated, crenated or ſcaly. India.

ſanguinolenta. 42. O. equivalve, with 9 thick obtuſe rays; interſtices longitudinally ſtriated, tuberculated and prickly. Red ſea.

maculoſa. 43. O. equivalve, pale yellow, with tawny ſpots; rays 12, thick and flattiſh; ears white, with tranſverſe ſcaly ribs.

nodoſa. 44. O. with 9 rays, covered with apparently veſicular tubercles. American and African oceans.

pes felis. 45. O. with 9 ſtriated rough rays; one of the ears very ſmall.

pellucens. 46. O. nearly equivalve, with 9 rays; ſmooth, with ſpoon-like hemiſpherical ſcales on the lower valve; minute, pellucid; upper valve ſpotted with red. African ſeas.

obliterata. 47. O. ſmooth on the outſide, with 24 doubled rays. Indian ocean.

ſanguinea. 48. O. equivalve, with 22 rays; ears ſmall; 2 inches long, $1\frac{1}{4}$ broad. Mediterranean and Atlantic ſeas.

varia. * 49. O. equivalve; rays about 30; compreſſed, and beſet with tranſverſe, prickly ſcales; one ear very ſmall; $2\frac{1}{4}$ inches long, 2 broad. European ſeas, coaſts of Britain.

puſio. * 50. O. equivalve, rays about 40, filiform; ſurface often irregular or diſtorted; 2 inches long, $1\frac{1}{2}$ broad. European and American ſeas, Cornwall.

obſoleta. * 51. O. equivalve, ſemi-tranſparent, ſmooth; dark purple; with 8 nearly obſolete rays; $\frac{3}{4}$ inch long. Britiſh coaſts.

levis. 52. O. ſmooth; ears red; $\frac{5}{8}$ inch long. Angleſea, Falmouth.

glabra. 53. O. ears nearly equal, equivalve, ſmooth, with from 10 to 15 ſmooth flattiſh rays; inſide with elevated double ſtriæ; 2 inches long, 2 broad. European and American ſeas.

opercularis * 54. O. rays 20; roundiſh and rough, with decuſſated ſtriæ; upper valve a little more convex; $2\frac{1}{2}$ inches diameter. North ſeas, Devonſhire and Cornwall, where it is called *frill* or *queen*.

gibba. 55. O. equivalve, gibbous, with 20 glabrous rays. American ſeas.

ſulcata. 56. O. white, with fleſh-coloured ſpots; rays glabrous, 32 on the lower valve, 35 on the upper; $1\frac{1}{2}$ inch long. Malabar.

hiſtrionica. 57. O. thin, flattened, pellucid, with fine tranſverſe wrinkles, and 11 rays which are waved.

icelandica. 58. O. orbicular, with purple circles, and about 100 ray; $3\frac{1}{2}$ inches long, $3\frac{1}{4}$ broad. Mediterranean. The fiſh of this ſpecies is employed as food.

triradiata. 59. O. equivalve, glabrous, immaculate, with minute ſtriæ; upper valve with 3 rays. Norway ſeas.

fuci. 60. O. nearly equivalve, ſtriated, ſpotted, rough towards the margin. Found on the fucus ſaccharinus in the North ſea.

tigerina. 61. O. nearly equivalve, ſtriated, glabrous, red, with whitiſh ſpots. On fuci in the North ſeas.

ſeptemradiata. 62. O. nearly equivalve, ſtriated, glabrous; rays 7, convex. North ſeas.

arata. 62. O. nearly equivalve; within and without grooved and red; one part rough, the other glabrous. North ſeas.

ſenatoria. 64. O. convex on each ſide, with 22 rounded, tranſverſe, wrinkled rays; interſtices with longitudinal, granulated ſtriæ; $2\frac{1}{2}$ inches long. Indian ocean.

citrina. 65. O. orange, with 22 rounded rays, and plaited margin; lower valve flatter. India.

turgida. 66. O. equally convex, both ſides with 20 glabrous rays; interſtices with tranſverſe, crowded wrinkles; margin with plaited teeth. Indian and American ſeas.

ſulphurea. 67. O. flattened, thin, pellucid, ſtriated with numerous imbricated rays; margin with crenated plates; 2 inches long. Red ſea.

porphyria. 68. O. convex, purple, within, white or red, with 25 thick, rounded ſcaly rays; $2\frac{1}{4}$ inches long. Red ſea.

vitrea. 69. O. hyaline, with an acute margin, very ſlender rays, and concentric ſcaly curves. North ſeas.

tranquebaria. 70. O. with 20 rounded rays; interſtices finely wrinkled; margin repand; upper valve more convex. Tranquebar.

fauciata. 71. O. white, with purple ſpots, and numerous unequal rays; margin crenated. Red ſea.

crenulata. 72. O. oblong, with undulated rays and ſtriæ; and tranſverſe, interrupted bands; a ſmall ſhell; margin crenulated.

innominata. 73. O. roundiſh, ſpotted; with deep grooves finely ſtriated tranſverſely: margin crenulated. Small.

rufeſcens. 74. O. roundiſh, pale, rufous, with 24 rays; ears with decuſſated ſtriæ; middle-ſized.

ſquamata. 75. O. roundiſh; rays thick, with diſtant parallel ſcales, and prickly at the ſides.

anonyma. 76. O. rather oblong, with narrow ſcaly rays; interſtices broader, and ſtriated perpendicularly: ears perpendicularly wrinkled.

decemradiata. 77. O. flattened, with 10 ſmooth, flat, unequal rays; ears tranſverſely ſtriated.

tenuis. 78. O. thin, with depreſſed, ſcaly rays; ears ſhort. India, and North ſeas.

valentii. 79. O. with 20 rays, and tranſverſe, ſemilunar bands. India.

media. 80. O. oblong, with crowded rays, middle-ſized, reddiſh.

crocea. 81. O. ſaffron-coloured, with muricated ſcaly rays alternately leſs; ſmall.

florida. 92. O. roundiſh, white, with roſy ſpots, radiated; ſmall.

ochroleuca 83. O. oblong, ochraceous, with rays ſmooth on one part, and granulated on the other; minute.

muſtelina. 84. O. pale, tawny, with yellow ſpots and bands, and ſmooth rays; ears tranſverſely ſtriated; $2\frac{3}{4}$ inches long.

85. O.

flammea. 85. O. ſaffron-coloured, oblong, with fine perpendicular ſtriæ; very minute.

incarnata. 86. O. oblong, fleſh-coloured, with interrupted red bands, and flattened rays;

guttata. 87. O. yellowiſh, rounded, dotted with red; rays unequally converging at the hinge.

depreſſa. 88. O. ochraceous, with flat bifid rays; 1 inch long.

regia. 89. O. roundiſh, deep-red, with rounded rays.

palliata. 90. O. equivalve, with numerous ſmooth rays: is leſs round, and has fewer rays, than *oſtrea pallium*.

ſeminuda. 91. O. orange, oblong, muricated, with ſcales as far as the middle; rays 22; 1¾ inch long, 1¼ broad.

modeſta. 92. O. roundiſh, hoary, with browniſh, reddiſh, and bluiſh ſpots; interſtices of the rays broad; 2 filiform bands at the hinge.

principalis. 93. O. purple, with a brown margin; rays ſcaly from the middle, and ſmooth at the hinge.

verſicolor. 94. O. variegated, with pectinated ſmooth rays.

c. *Valves more gibbous on one ſide.*

flavicans. 95. O. nearly equivalve, with 8 ſtriated rays: margin rounded on one ſide. South ſea.

faſciata. 96. O. equivalve, with 20 rough rays; interſtices ſtriated; ears equal, ſmall. Atlantic ſeas.

fragilis. 97. O. equivalve, with 25 rays; margin very entire; ears acute; 1¼ inch long. Nicobar iſlands.

lima. 98. O. equivalve, with 22 imbricated ſcaly rays, rounded at one margin; ears obliterated; 3 inches long, 2¼ broad. Mediterranean and Indian ſeas.

glacialis. 99. O. with 50 imbricated, interrupted rays; ears equal; one of them unequally plaited. American ocean.

hians. 100. O. whitiſh, thin, gaping on each ſide, and oblique, with obſolete, undulated rays, and tranſverſe, rounded, ſemilunar ſtriæ; 1½ inches long, ¾ broad. Norway.

excavata. 101. O. dirty white, with longitudinal, undulated ſtriæ, and a few tranſverſe rings; one ear obſolete; margin entire; 5 inches long 3¼ broad. Norway.

B. *Rough, and generally plaited on the outſide.* Oysters.

malleus. 102. O. equivalve, 3-lobed, 2 of them placed tranſverſely like the head of a hammer; 6 inches long, and 4½ broad. Deep parts of the Indian and Southern oceans. Very rare.

vulſella. 103. O. ſub-pellucid, narrow, elongated, lamellated; one end rounded; 3¼ inches long, 1 broad. Red ſea.

avatina. 104. O. pellucid, lamellated, and laterally incurved; 1 inch broad, and including the curvature, 3 inches long. Nicobar iſlands.

diluviana. 105. O. plaited on the outſide; margin with erect, acute, angular teeth; ſize of a common oyſter; found in a foſſil ſtate in the calcareous mountains of Sweden.

folium. 106. O. ovate, obtuſely plaited at the ſides; paraſitical; found adhering to gorgonia in the Indian ocean.

orbicularis. 107. O. orbicular, flat, with an entire crenated margin; ſize of the end joint of the thumb.

edulis. 108. O. *eatable or common oyſter;* orbicular and rugged, with undulated, imbricated ſcales; one valve flat, and very entire. European and Indian ſeas.—It is found, either in large beds, or adhering to rocks. The ſhell is of various ſizes, forms, and colours; within white, and often gloſſy, and of a pearly appearance. The old ſhells have often an anomia fixed to them, and they are frequently covered with the ſerpula and lepas, and the ſertularia and other zoophytes.

38 Oyſters employed as food.

The common oyſter has been long known as a nutritious food, and indeed in moſt countries is greatly eſteemed as a delicate luxury of the table. The oyſter is ſuppoſed by naturaliſts to be a hermaphrodite animal. The ſpawn which they caſt in May, adheres to the rocks and other ſubſtances at the bottom of the ſea; and the ſhell, it is ſuppoſed, is formed in the ſpace of 24 hours, and which, according to ſome, never leaves the ſpot till removed by violence. But from the obſervations of M. Dicquemare, who has particularly ſtudied the economy of the oyſter, it appears that it poſſeſſes the power of moving from place to place, and that it varies its habits according to circumſtances. Oyſters which are recently taken up from places which are left dry by the ſea open their ſhell, loſe their water, and die in a few days. But the ſame oyſters kept in reſervoirs, where they are left occaſionally by the ſea, expoſed to the rays of the ſun, to ſevere cold, or are diſturbed in their beds, acquire the habit of keeping the ſhell cloſe when they are uncovered with water, and exiſt without injury from this treatment for a long time. The oyſter ſhould be freſh, tender, and moiſt. Thoſe which are moſt eſteemed are caught at the mouths of rivers, and in clear water. The want of freſh water, it is ſaid, renders oyſters hard, bitter, and unpalatable. Mud and ſea weeds are extremely injurious to the propagation and increaſe of the oyſter. Other ſhell fiſh, and cruſtaceous animals, as muſſels, ſcallops, ſtar-fiſh and crabs, are their moſt deſtructive enemies.

39 Of different kinds.

Oyſters are of different colours in different places: in Spain they are found of a red and ruſſet colour; in Illyria brown, with the fiſh black, and in the Red ſea of the colour of the iris. The green oyſter, which is eaten in Paris, is brought from Dieppe. This colour is aſcribed to the verdure which encompaſſes the bed on which they are produced. The oyſters from Britanny in France too, have been long famous; but thoſe which are brought from Marennes in Saintogne, are in higheſt eſtimation. The oyſters which are edged with a ſmall brown fringe or beard, are generally preferred. Theſe are accounted by the epicures *fecundated oyſters*.

40 Adhere to trees in warm climates.

In tropical regions, the common oyſter is found attached to trees. This aſſertion of the growth of oyſters on trees has been often ranked among the exaggerated or groundleſs ſtories of the marvellous traveller; but this circumſtance, when properly explained, will not appear different from the uſual economy of this teſtaceous animal. In warm climates where vegetation is ſo much more luxuriant than in northern latitudes, a great variety of plants, among which are ſeen large trees, grow on the ſhores to the very edge of the ſea; and particularly on thoſe places which are ſheltered from the agitation of the waves. In ſuch places, at the heads of bays and harbours, great abundance of mangrove trees grow up from the bottom, where it is ſeveral feet deep, covered with water. It is generally on the mangrove tree that the oyſter is found in the Weſt Indies. Without the trouble of picking them from the trees, the branches growing under water to which they are attached, are cut off, carried home in baſkets, and in this ſtate brought to table, where they are either eaten raw, or roaſted, as the European oyſter. We have eaten oyſters which were produced in this way, in the Lagoons at the head of Port Morant harbour in Jamaica, a few minutes after they were taken from the water. They were of a ſmall ſize, but extremely delicate and high flavoured.

Britain has been noted for oyſters from the time of Juvenal, who, ſatirizing Montanus an epicure, ſays,

> ——*Circæis nata forent, an*
> *Lucrinum ad ſaxum, Rutupinove edita fundo,*
> *Oſtrea, callebat primo deprendere morſu.*

> He, whether Circe's rock his oyſters bore,
> Or Lucrine lake, or diſtant Richborough's ſhore,
> Knew at firſt taſte.

Pennant's Brit. Zool. vol. iv. p. 102.

The luxurious Romans were very fond of this fiſh, and had their layers or ſtews for oyſters as we have at preſent. Sergius Orata was the firſt inventor, as early as the time of L. Craſſus the orator. He did not make them for the ſake of indulging his appetite, but through avarice, and made great profits from them. Orata got great credit for his Lucrine oyſters; for, ſays Pliny, the Britiſh were not then known.

The ancients ate them raw, having them carried up unopened, and generally eating them at the beginning of the entertainment, but ſometimes roaſted. They alſo ſtewed them with mallows and ducks, or with fiſh.

41 Oyſters of Britain.

Britain ſtill retains its ſuperiority in oyſters over other countries. Moſt of our coaſts produce them naturally; and in ſuch places they are taken by dredging, and are become an article of commerce, both raw and pickled. The ſhells calcined are employed in medicine as an abſorbent, and in common with other ſhells, prove an excellent manure.

Stews or layers of oyſters are formed in places which nature never allotted as habitations for them. Thoſe near Colcheſter have been long famous; at preſent there are others that at leaſt rival the former, near the mouth of the Thames. The oyſters, or their ſpats, are brought to convenient places, where they improve in taſte and ſize. It is an error to ſuppoſe, that the fine green obſerved in oyſters taken from artificial beds, is owing to copper; this ſubſtance, or the ſolution of it, is deſtructive to all fiſh. The following is the account of the whole treatment of oyſters, from Biſhop Sprat's Hiſtory of the Royal Society, from p. 307 to 309.

"In the month of May the oyſters caſt their ſpawn, (which the dredgers call their *ſpats*): it is like to a drop of candle, and about the bigneſs of a halfpenny. The ſpat cleaves to ſtones, old oyſter-ſhells, pieces of wood, and ſuch like things, at the bottom of the ſea, which they call *cultch*. It is probably conjectured, that the ſpat in 24 hours begins to have a ſhell. In the month of May, the dredgers (by the law of the admiralty court) have liberty to catch all manner of oyſters, of what ſize ſoever. When they have taken them, with a knife they gently raiſe the ſmall brood from the cultch, and then they throw the cultch in again, to preſerve the ground for the future, unleſs they be ſo newly ſpat, that they cannot be ſafely ſevered from the cultch; in that caſe they are permitted to take the ſtone or ſhell, &c. that the ſpat is upon, one ſhell having many times 20 ſpats. After the month of May, it is felony to carry away the cultch, and puniſhable to take any other oyſters, unleſs it be thoſe of ſize, (that is to ſay) about the bigneſs of a half-crown piece, or when, the two ſhells being ſhut, a fair ſhilling will rattle between them.

"The places where theſe oyſters are chiefly catched, are called the *Pent-Burnham*, *Malden*, and *Colne-waters*; the latter taking its name from the river of Colne, which paſſeth by Colcheſter, gives name to that town, and runs into a creek of the ſea, at a place called the *Hythe*, being the ſuburbs of the town. This brood and other oyſters they carry to the creeks of the ſea, at Brickleſea, Merſy, Langno, Fingrego, Wivenho, Toleſbury, and Saltcoaſe, and there throw them into the channel, which they call their *beds* or *layers*, where they grow and fatten; and in two or three years the ſmalleſt brood will be oyſters of the ſize aforeſaid. Thoſe oyſters which they would have green, they put into pits about three feet deep in the ſalt marſhes, which are overflowed only at ſpring-tides, to which they have ſluices, and let out the ſalt water until it is about a foot and a half deep. Theſe pits, from ſome quality in the ſoil co-operating with the heat of the ſun, will become green, and communicate their colour to the oyſters that are put into them in four or five days, though they commonly let them continue there ſix weeks or two months, in which time they will be of a dark green. To prove that the ſun operates in the greening, Toleſbury pits will green only in ſummer; but that the earth hath the greater power, Brickleſea pits green both winter and ſummer: and for a further proof, a pit within a foot of a greening pit will not green; and thoſe that did green very well, will in time loſe their quality. The oyſters, when the tide comes in, lie with their hollow ſhell downwards; and when it goes out, they turn on the other ſide; they remove not far from their place, unleſs in cold weather, to cover themſelves in the ooſe. The reaſon of the ſcarcity of oyſters, and conſequently of their dearneſs, is, becauſe they are of late years bought up by the Dutch.

"There are great penalties by the admiralty court laid upon thoſe that fiſh out of thoſe grounds which the court appoints, or that deſtroy the cultch, or that take any oyſters that are not of ſize, or that do not tread under their feet, or throw upon the ſhore, a fiſh which they call a *five-finger*, reſembling a ſpur-rowl, becauſe that fiſh gets into the oyſters when they gape, and ſucks them out.

"The reaſon that ſuch a penalty is ſet upon any that ſhall deſtroy the cultch, is, becauſe they find that if that be taken away, the ooſe will increaſe, and the muſcles and cockles will breed there, and deſtroy the oyſters, they having not whereon to ſtick their ſpat.

"The oyſters are ſick after they have ſpat; but in June and July they begin to mend, and in Auguſt they are perfectly well; the male oyſter is black-ſick, having a black ſubſtance in the fin; the female white-ſick (as they term it), having a milky ſubſtance in the fin. They are ſalt in the pits, ſalter in the layers, but ſalteſt at ſea."

The oyſter affords the curious in microſcopic obſer-

42 Liquid about the oyſter ſeen with the microſcope.

vations a very pleaſing entertainment. In the clear liquor many little round living animalcules have been found, whoſe bodies being conjoined, form ſpherical figures, with tails, not changing their place otherwiſe than by ſinking to the bottom, as being heavier than the fluid; theſe have been ſeen frequently ſeparating, and then coming together again. In other oyſters, animalcules of the ſame kind were found, not conjoined, but ſwimming by one another, whence they ſeemed in a more perfect ſtate, and were judged by Mr Leeuwenhoek to be the animalcules in the roe or ſemen of the oyſter.

A female oyſter being opened, incredible multitudes of ſmall embryo oyſters were ſeen, covered with little ſhells, perfectly tranſparent, and ſwimming along ſlowly in the liquor; and in another female, the young ones were found of a browner colour, and without any appearance of life or motion.

Monſieur Joblot alſo kept the water running from oyſters three days, and it appeared full of young oyſters ſwimming about nimbly in it; theſe increaſed in ſize daily; but a mixture of wine, or the vapour of vinegar, killed them.

In the month of Auguſt oyſters are ſuppoſed to breed, becauſe young ones are then found in them. Mr Leeuwenhoek, on the 4th of Auguſt, opened an oyſter, and took out of it a prodigious number of minute oyſters, all alive, and ſwimming nimbly about in the liquor, by means of certain exceeding ſmall organs, extending a little way beyond their ſhells; and theſe he calls their beards. In theſe little oyſters, he could diſcover the joinings of the ſhells; and perceived that there were ſome dead ones, with their ſhells gaping. Theſe, though ſo extremely minute, are ſeen to be as like the large oyſters in form as one egg is to another.

As to the ſize of them, he computes, that 120 of them in a row would extend an inch; and conſequently, that a globular body, whoſe diameter is an inch, would, if they were alſo round, be equal to 1,728,000 of them. He reckons 3000 or 4000 are in one oyſter, and found many of the embryo oyſters among the bairds; ſome faſtened thereto by ſlender filaments, and others lying looſe: he likewiſe found animalcules in the liquor 500 times leſs than the embryo-oyſters.

It is not uncommon to ſee on oyſter-ſhells, when in a dark place, a ſhining matter or bluiſh light, which ſticks to the fingers when touched, and continues ſhining and giving light for a conſiderable time, though without any ſenſible heat. This ſhining matter being examined with a microſcope, is ſaid to conſiſt of three ſorts of animalcules; but it is more probable that it is the phoſphoreſcent light which ſeparates from animal matters, particularly fiſh, in the incipient ſtage of the putrefactive proceſs.

ſemiaurata. 109. O. oval, ſlightly eared, ſmooth, with an oblique baſe; 1½ inch long, 1¼ broad. Mediterranean.

ſtriata. * 110. O. oval, with longitudinal, irregular, undulated filiform ridges; inſide ſmooth, gloſſy white, with a pearly hue. European ſeas, ſhores of Britain.

fornicata. 111. O. rough, oblong, linear, with divergent hinges; internally vaulted. Red ſea.

ſinenſis. 112. O. rough, lamellated, unequal, and glabrous within; lower valve large; 4 inches long. Chineſe ſhores.

ſpondyloidea. 113. O. equivalve, pellucid, flattened, oval, with perpendicular, undulated ſtriæ on the upper valve: 3 inches long, 2½ broad. India.

forſkahlii. 114. O. plaited, and terminating in a long, incurved, hollow beak; middle ribs with imbricated, ſpinous wrinkles; 2 inches long, and 1 broad. Red ſea.

plicatula. 115. O. with longitudinal, wrinkled plaits; lower valve ſmaller and flatter; varies much in ſhape and ſize. American and Mediterranean ſeas.

roſtrata. 116. O. oblong, rugged; upper valve lamellated, with a denticulated margin; the lower excavated, and longitudinally grooved. Mediterranean.

virginica. 117. O. nearly equivalve, thick, rough, lamellous; one valve with a prominent beak; 9 inches long, and 4 broad. American and Indian oceans.

cornucopiæ 118. O. upper valve flat, lower one hollow and ſtriated; rough with ſcales, wrinkles and plaits, and terminating in an elongated beak. Indian and African oceans.

paraſitica. 119. O. thin; lower valve convex and thicker; the other flat. Atlantic and Indian ſeas.—This ſpecies, like the common oyſter, fixes itſelf to the roots and branches of trees, particularly the mangrove, which grow out of the water. It varies in form and ſize, and is often as large as the palm of the hand.

exalbida. 120. O. thin; upper valve longer and more convex. Adriatic.—It is found fixed to other ſhells.

criſtata. 121. O. rugged, with imbricated lamellæ; margin with obtuſely plaited teeth; 1 inch long.

ſenegalenſis. 122. O. equivalve, roundiſh, ſmooth, flat; 2 inches diameter. Shores of Senegal.

ſtellata. 123. O. thin, depreſſed, rough, unequal; upper valve ribbed; ribs with a few ſpines. Guinea.

ovalis. 124. O. oval, thin, terminating in a ſhort, acute, lateral channelled beak; ſtriæ perpendicular, unequal, obſolete; 1 inch long.

papyracea. 125. O. roundiſh, ſnowy, thin, pellucid; upper valve terminating in a ſhort, acute beak.

annulata. 126. O. equivalve, orbicular, white, with concentric ſemicircles. North ſeas.

retuſa. 127. O. equivalve, oblong, white, glabrous, ſtriated; with an umbo or knot remote from the hinge. North ſeas.

C. *Hinge with a perpendicular grooved line.*

perna. 128. O. equivalve, obovate, unequal, rounder at one end; 2½ inches long; has ſome reſemblance to a gammon of bacon. Indian and American ſeas.

iſogonum. 129. O. equivalve, with a larger lobe, forming a right angle with the hinge; from 5 to 7 inches long, and 1¼ broad in the middle; ſhell blackiſh, violet without, pearly within. Indian ocean and South ſeas. Is a rare ſhell.

ephippium. 130. O. equivalve, orbicular, compreſſed, membranaceous; 5 inches long, 5½ broad. Indian ocean and Cape of Good Hope. Very rare.

picta. 131. O. equivalve, thin, pellucid, and pointed at the hinge; the other end dilated; margin acute; 2 inches long, more than an inch broad. Red ſea.

legumen. 132. O. flat, hoary, thin, pellucid, lamellated; interſtices of the grooves black; 2 inches long, 4 lines broad. Nicobar iſlands.

133. O.

alata. 133. O. flat, brittle, pellucid; dilated towards the margin. America.

mytiloides. 134. O. nearly equivalve, ovate, ventricoſe, ſtraight.

torta. 135. O. equivalve, intorted.—This and the preceding ſpecies are found foſſil in Alſace.

pes-lutræ. 136. O. equivalve, ſmooth, wedge-ſhaped with 6 obtuſe plates, varied with purpliſh, and white and marked with fine longitudinal ſtriæ; margin ſlightly ſcalloped.

Gen. 15. ANOMIA.

43 Anomia. *Gen. Char.*—The animal is a ligula or ſtrap-ſhaped body, emarginated and ciliated; the briſtles being fixed to the upper valve. There are two linear arms, longer than the body, open, ſtretched out, alternate on the valve, ciliated on both ſides; the hairs are fixed to both valves; the ſhell is inequivalve; one valve being rather flat, the other more gibbous at the baſe, with a produced beak, generally curved over the hinge; one of the valves is often perforated at the baſe; the hinge is without teeth. A ſmall linear ſcar appears prominent, with a lateral tooth placed within; but on the very margin of the flat valve. There are two bony rays for the baſe of the animal.

SPECIES.

craniolaris 1. A. orbicular; the gibbous valve conico-convex, flat valve with three hollows at the baſe; 1 inch long, ½ broad. Mediterranean ſeas and Philippine iſlands. It is ſometimes found foſſil.

pectinata. 2. A. oblong, with branched grooves; the gibbous valve with two hollows behind. An inch long, ¾ broad; flat valve perforated. Mediterranean.

ephippium. * 3. A. roundiſh, pellucid, with wrinkled plates; flat valve perforated; diameter ſometimes 3½ inches, moſt frequently about 2. European and American ſeas, ſhores of Britain.—It is often found adhering to the common oyſter. Mr Montagu thus accounts for the perforation in theſe ſhells. The teſtaceous plug, he obſerves, by which the animal fixes itſelf to other bodies, is firmly attached by ſtrong ligaments to theſe bodies, and ſo cloſely cemented, that they become inſeparable. When, therefore, the ſhell is torn from its native place, the plug is left behind upon the ſtone or other ſhell to which it adhered.

cepa. * 4. A. obovate, unequal, violet; upper valve convex; lower perforated. European and American ſeas, ſhores of Britain.

electrica. 5. A. roundiſh, yellow, ſmooth; one valve convex and gibbous; very thin. Coaſts of Africa.

ſquamula. * 6. A. ſmall, orbicular, entire, thin like the ſcale of a fiſh. European ſeas, Britain.

patelliformis. 7. A. ovate, convex, ſubdiaphanous, ſtriated; poſterior beak recurved and ſmooth. North ſeas.

ſcobinata. 8. A. roundiſh, ſmooth, and rough within; beak perforated.

aurita. 9. A. ſubovate, ſtriated, and ſlightly eared; beak perforated. Norway ſeas.

retuſa. 10. A. obovate, ſtriated, retuſe, with a longitudinal cavity; beak perforated. Norway ſeas, adhering to zoophytes.

gryphus. 11. A. oblong, ſmooth, with an obſolete lateral plate on one valve, and incurved beak; the other valve ſhort and flattiſh. Frequently found in a foſſil ſtate.

pecten. 12. A. ſemiorbicular, depreſſed, with numerous ſtriæ; one valve flat. Found in a foſſil ſtate.

ſtriatula. 13. A. roundiſh, and a little dilated; gibbous on each ſide; ſtriated; valves equal. Has been only found foſſil.

truncata. 14. A. ſuborbicular, obſoletely ſtriated; hinge truncated. European ſeas.

reticularis. 15. A. heart-ſhaped, with decuſſated ſtriæ; ſhorter valve more gibbous. Found foſſil.

plicatella. 16. A. dilated, lunated, plaited with longitudinally ſtriated grooves. Found only in a foſſil ſtate.

criſpa. 17. A. dilated, triangular, plaited with wrinkled grooves; the middle broader. Found foſſil in England and Switzerland.

lacunoſa. 18. A. roundiſh with numerous grooves; valves plaited at the tip; one of them ſhorter and pitted. Found only in a foſſil ſtate.

pubeſcens. 19. A. obovate, grooved; beak of one valve prominent, the other gaping; about the ſize of a cucumber ſeed, covered with ſmall, erect, diſtant hairs. Norway ſeas.

cuſpidata. * 20. A. conic, pointed, grooved; one valve convex with an incurved beak; the other pyramidal with a large triangular foramen. Found in Derbyſhire in a foſſil ſtate.

farcta. 21. A. roundiſh with numerous grooves; the valves convex, and 8-toothed at the tip. Found foſſil in Switzerland and Weſtphalia.

caput-ſerpentis. 22. A. obovate, ſtriated, downy; one valve with a longer perforated beak. Norway ſeas. It is generally found adhering to the madrepora prolifera.

terebratula. 23. A. obovate, ſmooth, convex; one valve with three plates; the other with two; the beak of one valve prominent and perforated. Found frequently in a foſſil ſtate.

angulata. 24. A. with compreſſed plates at the ſides of the baſe, anteriorly; the middle three-toothed. Found foſſil.

hyſterita. 25. A. dilated, ſmooth, convex; ſtriated with about 3 lobes; anterior part depreſſed, with an acute margin. Found foſſil in Germany.

biloba. 26. A. two-lobed, equal, ſtriated. Only found foſſil.

placenta. 27. A. orbicular, flat, pellucid; hinge with two linear calloſities growing within the ſhell; 5 inches diameter. Indian ocean.

cella. 28. A. nearly quadrangular, convex, and nearly cloſed; bronzed; margin repand; 7 inches diameter. Indian ocean.

ſpinoſa. * 29. A. covered with ſpines as long as the ſhells. England, in a foſſil ſtate.

aculeata. 30. A. roundiſh, prickly; crown ſmooth and recurved behind; lower valve flat, ſmooth, and perforated at the crown. Norway ſeas.

muricata. 31. A. hyaline, ventricoſe; crown bent towards the right; upper valve longitudinally ſtriated; lower valve flat, very thin, and the circumference of the perforation elevated. Guinea.

ſquama. 32. A. oblong, with a rounded margin; one valve flat, thin, ſmooth, with a large ovate perforation at the tip; the other convex, and longitudinally ſtriated. Seas of Norway.

punctata. 33. A. orbicular, hyaline, thin, punctured; flat valve perforated at the tip; ſmall, brittle. Ferro iſlands.

undulata. * 34. A. margin crenated; flat valve thin and ſmooth, with a large oval perforation; convex valve with tranſverſe arched ſtriæ, croſſing undulated longitudinal ones. Mediterranean, North ſeas, Devonſhire.

capenſis. 35. A. longitudinally ſtriated, a little truncated; with a rounded notched margin. C. of G. Hope.

detruncata 36. A. truncated, orbicular, longitudinally ſtriated; flat valve with three ribs within; other valve longitudinally ſtriated within, and divided by a partition in the middle. Mediterranean.

ſanguinolenta. 37. A. horny, ſmooth, and convex on each ſide; upper valve emarginated, and radiated at the ſides, with an elevated ſanguineous back. India.

vitrea. 38. A. ovate, ventricoſe, hyaline; lower valve with two bony rays at the hinge, beſides lateral teeth; upper valve with a prominent perforated tip; 1½ inch long, 1 inch broad. Mediterranean.

cranium. 39. A. ſmooth, ventricoſe, finely ſtriated tranſverſely; ½ inch broad, ſomething longer. Norway ſeas.

dorſata. 40. A. heart-ſhaped, ſolid, with arched tranſverſe ring and wrinkles, and longitudinal ſtriæ and grooves. Magellanic ſeas.—Is often found foſſil.

pſittacea. 41. A. horny and finely ſtriated longitudinally; ſhorter valve gibbous; longer one flat, with an incurved tip, triangularly perforated; rather large, pellucid. Greenland. Very rare.

tridentata. 42. A. yellowiſh, pellucid, thin, finely ſtriated tranſverſely; tricuſpidate with tubular points; valves united. Mediterranean.

ſpondyloides. 43. A. ovate, antiquated, with an obtuſe channelled beak.

ventricoſa. 44. A. ſubovate, ſolid, with a channelled beak.

gryphoides. 45. A. oval, ſmooth, ſolid, opaque; leſſer valve with a ſtraight, obtuſe, truncated beak.

flexuoſa. 46. A. very thin, lamellated, hollowed in the middle; upper valve flat; lower valve convex towards the crown, with an orbicular perforation beneath it. Norway ſeas.

rugoſa. 47. A. obovate; upper valve convex and finely wrinkled; lower valve thin and ſmooth, with a kidney-ſhaped perforation. Norway ſeas.

cylindrica. 48. A. very thin, cylindrical, and narrowed outwardly; upper valve gibbous, lower hollow. North ſeas.

nucleus. 49. A. glabrous, oval, longitudinally grooved. North ſeas.

avenacea. 50. A. pyriform, protracted, and ſlightly compreſſed towards the hinges. North ſeas.

ſandalium. 51. A. turbinated; back flat, with a ſtriated cavity; lid flat and hemiſpherical. Germany, in a foſſil ſtate.

44 Mytilus.

Gen. 16. Mytilus, *The Muſſel.*

Gen. Char.—The animal is allied to an aſcidia; the ſhell bivalve, rough, generally affixed by a byſſus or beard of ſilky filaments; hinge moſtly without teeth, with generally a ſubulate, excavated, longitudinal line.

Species.

A. *Paraſitical, affixed as it were by claws.*

criſta galli. 1. M. plated, ſpinous; both lips rough. Indian ocean and Red ſea.

hyotis. 2. M. plaited and imbricated, with broad compreſſed ſcales; both lips ſmooth. Inhabits the ocean, on beds of coral.

frons. 3. M. plaited, ſmoothiſh; one lip rough. American ocean.

B. *Flat, or compreſſed into a flattened form, and ſlightly eared.*

margaritiferus. 4. M. *Pearl-bearing muſſel.* Flattened, nearly orbicular, with a tranſverſe baſe; imbricated with toothed tunics. American and Indian ſeas.—This ſpecies is about 8 inches long, and ſomewhat broader; the inſide is finely poliſhed, and produces the true mother-of-pearl; and frequently alſo it affords the moſt valuable pearls. When the outer coat of the ſhell, which is ſometimes ſea-green, or cheſnut with white rays, or whitiſh with green rays, is removed, it exhibits the ſame pearly luſtre as the inſide; the younger ſhells have ears as long as the ſhell, and reſemble ſcallops.

unguis. 5. M. roundiſh; longitudinally ſtriated, pellucid, and ſlightly eared. Mediterranean.

C. *Ventricoſe or convex.*

lithophagus. 6. M. cylindrical; rounded at both ends. European, American, and Indian ſeas. It is about an inch broad, and 3 long.—It perforates and eats away coral rocks, and even the hardeſt marbles. Thoſe which are found in Europe have a thin brittle ſhell: the ſhell of thoſe found in India is ſoft, and nearly coriaceous.

rugoſus. 7. M. rhombic, oval, brittle, rugged, antiquated, and rounded at the ends. Seas and lakes, north of Europe.—It is uſually found lodged in limeſtone; each individual in a ſeparate apartment, with apertures too ſmall for the ſhell to paſs through.

bilocularis 8. M. ſtriated, with vaulted knobs, and a white partition. Nicobar iſlands.

exuſtus. 9. M. convex; one of the margins angular; the anterior extremity crenated; 1¼ inch long. American ocean and Red ſea.

barbatus. 10. M. ſmoothiſh; ferruginous on the outſide, and bearded at the tip; ¾ inch long. Mediterranean and Norway ſeas.

edulis. * 11. M. *Eatable or common muſſel.* Smooth, violet; valves ſlightly recurved on the obtuſe ſide, and ſomewhat angular on the acute ſide; beaks pointed; from 2 to 3 inches long. European and Indian ſeas.—This ſpecies is obſerved to be larger within the tropics, and to diminiſh gradually towards the north. It is found in large beds, and generally attaches itſelf to other bodies by means of its long ſilky beard. The fiſh is employed as food in many parts of the world, and is eſteemed rich and nutritious.

incurvatus * 12. M. very crooked on one ſide near the beaks, then generally dilated; within with a violet tinge. Coaſt of Angleſea.

pellucidus. * 13. M. oval, tranſparent, and elegantly radiated lengthwiſe with purple and blue; two inches long. Angleſea, in oyſter beds.

umbilicatus. * 14. M. contracted into a deep rugged cavity, oppoſite the hinge, forming a deep hollow when the valves are cloſed; 5 inches long. Angleſea.

curtus. * 15. M. ſhort, ventricoſe, obtuſe at the beaks, and dirty yellow. Weymouth.

ungulatus. 16. M. ſmooth, ſlightly curved; hind margin inflected; hinge terminal, two-toothed. Mediterranean, Cape of Good Hope, and New Zealand. Found at the latter place reſembling *M. edulis;* but is 5 inches long, and 2½ broad.

17. M.

bidens. 17. M. ſtriated, ſlightly curved; hind margin inflected; hinge terminal, two-toothed; ſcarcely an inch long. Mediterranean and Atlantic ſeas.

modiolus. * 18. M. ſmooth, blackiſh, obtuſe at the ſmaller end, and rounded at the other; one ſide angular, near the beaks; from 6 to 7 inches long, 3 broad. European, American, and Indian ſeas, Devonſhire, Weymouth.

cygneus. * 19. M. ovate, very brittle, tranſverſely wrinkled; anterior end compreſſed, the other rounded; hinge lateral; from 2 to 5 inches broad, and 3 long. Frequent in the lakes and rivers of Europe, Britain.—It is the largeſt of Britiſh freſh-water ſhells. It arrives at the greateſt ſize in ponds and ſtagnant waters.

anatinus. 20. M. oval, a little compreſſed; brittle and ſemitranſparent, with a membranaceous margin. Freſh waters of Europe.—It reſembles the laſt, but is longer and narrower. Ducks and crows, it is ſaid, are extremely fond of both this and the laſt ſpecies.

viridis. 21. M. ſmooth, ovate, membranaceous, pellucid, with a terminal hinge. Southern ocean.

ruber. 22. M. wrinkled; valves oblique and anteriorly dilated. Southern ocean.

albus. 23. M. tranſverſely ſtriated; beaks gibbous; hinge lateral; 6 inches long, $3\frac{1}{2}$ broad. Shores of Chili.—The fiſh is white, and affords a grateful food.

ater. 24. M. grooved, and ſcaly behind. Chili.—The fiſh is black, and unfit for being eaten.

diſcors. * 25. M. oval, horny, ſubdiaphanous; extremities longitudinally ſtriated; middle tranſverſely. European and ſouthern ſeas, Cornwall and Devonſhire. From the South ſeas it is $1\frac{1}{2}$ inch broad; in Britain rarely exceeds $\frac{1}{2}$ inch.

hirundo. 26. M. ſmooth; valves 2-lobed; lobe at the hinge longer and thinner. American, Mediterranean, and Indian ſeas.

pholadis. 27. M. oblong; more obtuſe on the fore-part; rough, with tranſverſe wrinkles; $1\frac{1}{2}$ inch long, $1\frac{1}{4}$ broad. North ſeas.—This ſpecies penetrates beds of coral and other rocks, like the pholas.

ſtriatulus. 28. M. finely ſtriated, hinge terminal, 1 tooth; $1\frac{1}{4}$ inch long, $1\frac{1}{2}$ broad. Northern and Indian ſeas.

vulgaris. 29. M. flattened on one ſide and inflected; beaks incurved, convergent; hinge 1-toothed. American ocean.

plicatus. 30. M. rhombic, inequilateral; tranſverſely ſtriated and wrinkled; beaks incurved. Nicobar iſlands.

niveus. 31. M. ovate, ſubdiaphanous; finely ſtriated longitudinally; margin acute; hinge 2-toothed; ſhell ſnowy and poliſhed within. Nicobar iſlands. Very rare.

afer. 32. M. nearly triangular, dilated before, and flattiſh gaping behind; beaks pointed, turned back; margin very acute; 4 inches long, 2 broad. Mediterranean and African ſhores.

ſmaragdinus. 33. M. nearly triangular, flattiſh; hinge 2-toothed in one valve, 1-toothed in the other. Tranquebar, Guinea.

verſicolor. 34. M. nearly triangular, flattiſh; hinge 1-toothed; margin glabrous, acute; 3 inches long, 2 broad. Guinea.

coralliophagus. 35. M. carinated in the middle, and crenated at the margin, with an obtuſe knob; $\frac{3}{4}$ inch long. Indian and American oceans. Perforates rocks like a pholas.

lineatus. 36. M. triangular and dilated outwards, with angular, decuſſated, and confluent lines; hinge 2-toothed. A minute ſhell.

faba. 37. M. oval, rufous, ſtriated, with a crenulated margin. Seas of Greenland.—This ſpecies is the food of the *anas hiemalis* and *hiſtrionica*.

fluviatilis. 38. M. thin, ſlightly wedged; beaks recurved and large. Freſh waters of Europe.

fuſcus. 39. M. oblong, narrow, finely ſtriated tranſverſely; one ſide emarginated, the other rounded; beaks prominent, curved. A minute brown ſhell.

mammarius. 40. M. broad, ſhort, and rounded behind; beaks mammaconic, protuberant.

perſicus. 41. M. broad, and curved with a rough, rugged, yellow coat; within milky. Perſian ſea.

pictus. 42. M. broad, very ſmooth, flammeous or roſe-coloured, with white bands; beaks obtuſe. Portugal.

faſciatus. 43. M. pellucid, ſhining, bluiſh, with a claret colour and pale red bands. Brazil.

undatus. 44. M. broad and rounded at both ends; claret colour, with waved, bluiſh, and greeniſh ſtriæ; margin ſerrated. Portugueſe ſea.

purpureus. 45. M. rounded behind; pale fleſh-colour; purple within; margin denticulated. Shores of Brazil.

ſaxatilis. 46. M. ear-ſhaped, with granulated wrinkles on the outer ſide, dilated and rounded. Amboyna.

argenteus. 47. M. tranſverſely ſtriated, rounded at each end; brown, ſilvery within; beaks rounded.

fulgidus. 48. M. narrow, ſhining bluiſh colour, with violet ſpots at the ſides; beaks rounded, dilated. Seas of Magellan.

azureus. 49. M. gibbous, azure, with yellowiſh ſtripes beneath; beaks obtuſe; 1 inch broad, $\frac{3}{4}$ long.

murinus. 50. M. mouſe-coloured, with violet ſpots, and a broad, rounded, roſy margin; beaks pointed ſtraight. Guinea.

teſtaceus. 51. M. long, narrow, covered with a teſtaceous ſkin; ſhining ſilvery beneath, varied with blue, red, yellow, and brown.

virgatus. 52. M. dilated outwardly; greeniſh yellow, with roſy ſtripes; beaks obtuſe, curved.

cordatus. 53. M. oblong, very thin, white, with obſolete ſtriæ, and a heart-ſhaped gap behind. Indian and Southern oceans.

ſtagnalis. 54. M. oval, flattiſh, and tranſverſely ribbed; eight inches broad, $4\frac{1}{2}$ long. In freſh waters.

zellenſis. 55. M. oval, convex, rounded behind; elongated, and obtuſely pointed before; beaks obſolete; 7 inches broad, 3 long. Stagnant waters of Germany.

roſeus. 56. M. ſuborbicular, with 15 triangular creſted grooves, and alternate triangular teeth; 3 inches broad. Africa.

puniceus. 57. M. gibbous, pointed, with 15 grooves; margin toothed; 14 lines long, and half as broad; hinge with 4 minute teeth. Africa.

niger. 58. M. flat, thin, with fine grooves, covered with a black ſkin, under which it is milky, and finely poliſhed; $1\frac{1}{2}$ inch long; grooves about 100. Africa.

lævigatus. 59. M. flat, ſmooth, covered with a thick fulvous ſkin, under which it is roſy; $2\frac{1}{2}$ inches long. Africa.

dubius. 60. M. tranſverſely wrinkled; obtuſe at each end; fulvous, within pearly; beaks obſolete; hinge without teeth; 5 inches broad, 2 long. Freſh waters of Senegal.

polymorphus. 61. M. 5-celled; valves carinated and flattiſh on the incumbent ſide; beaks obtuſe and inflected backwards; ſize of a plum ſtone. Ruſſian ſea, and in freſh waters, where it is much larger.

canaliculatus. 62. M. ſmoothiſh, cheſnut brown; within party coloured; ſocket of the hinge channelled.

roſtrum. 63. M. oblong, thin, truncated; beaks ſharp and carinated; valves gaping at the end. Amboyna.

camellii. 64. M. oblong, thin, truncated; beak ſharp and carinated; valves completely cloſed. Japan.

avonenſis. * 65. M. with a ſuboval ſhell, of an olivaceous brown colour, with concentric wrinkles; ſize of the M. *anatinus*, but broader in proportion to its length. The poſterior ſide generally more obtuſe and rounded. River Avon in Wiltſhire. *Montagu*, *Teſt. Brit.* 172.

Gen. 17. PINNA, *Sea-Wing.*

45 Pinna. *Gen. Char.*—The animal a limax; the ſhell bivalve, fragile, upright, gaping at one end, and furniſhed with a byſſus or beard. Hinge without teeth; the valves united into one.

SPECIES.

rudis. 1. P. vaulted with arched ſcales, arranged in rows; from 12 to 16 inches long, and from 4 to 8 broad; red; from 6 to 8 grooves. Atlantic, Indian, and Red ſeas.

pectinata. 2. P. longitudinally ſtriated half way; one ſide ſlightly wrinkled tranſverſely; 3 inches long, 4 broad. Indian ocean.

nobilis. 3. P. ſtriated, with channelled, tubular, ſubimbricated ſcales; 7½ inches long, 3½ broad. Mediterranean, Adriatic, and American ſeas.

muricata. * 4. P. ſtriated with concave, ovate, acute ſcales; from 3 to 9 inches long, and 1 to 3 broad. European and Indian oceans, Weymouth.

rotundata. 5. P. with obſolete ſcales, margin rounded; ſometimes 2 feet long. Mediterranean.

ſquamoſa. 6. P. with fine undulated ſcales, and flexuous, broad wrinkles; ſmaller end pointed and naked; 13 inches long, 6½ broad. Mediterranean.

carnea. 7. P. thin, fleſh colour, naked, longitudinally grooved; external margin acute and rounded.

ſaccata. 8. P. ſmooth, ſatchel-ſhaped; a little erect, and ſlightly faſtigiated; 3¾ inches long, 2¼ broad. Mediterranean and Indian ſeas.

digitiformis. 9. P. ſmooth, tubular, finger-ſhaped, incurved; extreme margin membranaceous; pellucid.

lobata. 10. P. naked, lobed, ſtraw-coloured, with purple ſtriæ.

vitrea. 11. P. hyaline, with longitudinal, waved ſtriæ; the ſtriæ with a few ſcales, and croſſed by other tranſverſe ſtriæ at the margin. Indian ocean. Very rare.

incurva. 12. P. narrow, long, naked, carinated, with tranſverſe, undulated wrinkles. Indian ocean.

bicolor. 13. P. thin, inflected at the lateral margin; yellowiſh, with black brown rays; thinly ſtriated longitudinally. Red ſea.

exuſta. 14. P. flattiſh, horny, with blackiſh rays, ſpots, and clouds; and many ſmooth ſtriæ. Southern ocean of India. Red ſea.

vexillum. 15. P. truncated at the outer margin; dilated, naked, with a few black clouds; ſtriated longitudinally on the fore-part, and tranſverſely wrinkled behind. India. Very rare.

papyracea. 16. P. thin, brittle, horny, longitudinally ribbed; extreme margin roundiſh. Indian ocean.

ſanguinea. 17. P. flattiſh, ſlightly incurved, red, with a few perpendicular, ſmooth ſtriæ; 3 inches long.

bullata. 18. P. very ſtraight, thin, and perpendicularly ſtriated, with tranſverſe, ſpinous wrinkles, on the lower margin.

General Obſervations.—It has been doubted whether the animal which inhabits the pinna be a limax or ſlug, according to the opinion of Linnæus; and it is even aſſerted, that it has not the ſmalleſt affinity with this animal, but approaches much more nearly to that which belongs to the mytilus. In proof of this, it is ſaid that the pinna poſſeſſes no locomotive power, but remains fixed by its byſſus or beard to other bodies; and ſo firmly attached, that it can by no means be diſengaged at the will of the animal; for the fibres are ſtrongly agglutinated to the ſand, gravel, or other extraneous bodies within reach. Indeed it ſeems not at all improbable that all teſtaceous animals, furniſhed with a ſimilar beard, are intended by this ſtructure to remain attached to the ſpot where they are originally produced.

This ſhell-fiſh was celebrated among the ancients on account of the cloth which was made of the fine byſſus or beard by which it is attached. As a rare and coſtly production it brought a high price, and was held in great eſtimation. At the preſent day even, according to the information of modern travellers, the inhabitants of Palermo and Naples manufacture gloves and ſtockings from the ſame ſubſtance.

The pinna has obtained a little reputation for the practice of ſome of the moral virtues, in treating a ſmall ſpecies of crab with hoſpitality and friendſhip, by receiving it into the ſhell, and defending it againſt its enemies. In return for this kindneſs, the crab, like the jackall with the lion, acts the parts of a provider and monitor, by warning its hoſt of the preſence of its prey or of the approach of an enemy. But this friendly intercourſe accords ill with the nature of the animals between whom it is practiſed. The crab, it is far more probable, is a troubleſome intruder; and notwithſtanding all the ſervice he can repay, is conſidered as a very unwelcome gueſt, and is indebted for his lodging to his own activity, and the ſluggiſh nature of his hoſt, rather than to his kindneſs and hoſpitality.

III. UNIVALVE SHELLS.

Gen. 18. ARGONAUTA.

46 Argonauta. *Gen. Char.*—The animal is a ſepia or clio. The ſhell is univalve, ſpiral, involute, membranaceous, one-celled.

SPECIES.

argo. 1. A. *The paper nautilus.* Keel or ridge of the ſhell ſlightly toothed on each ſide. The ſhell, which is thin as paper, brittle, and tranſparent, is white or yellowiſh, with ſmooth or knotty ſtriæ or ribs, which are ſometimes forked; the keel is generally browniſh. This ſhell preſents conſiderable varieties. Sometimes the keel is narrow, and marked with cloſe bifurcated wrinkles; ſometimes it has a broad keel with tuberculated ribs; and ſometimes a broad tuberculated keel with few and ſmooth ribs.

The ſingular ſtructure and wonderful economy of this animal very early attracted the attention of naturaliſts. To its progreſſive motion on the ſurface of the ocean, mankind are indebted, it is ſaid, for the firſt hint of the art of navigation. This is alluded to in the numbers of Pope.

> Learn of the little nautilus to ſail,
> Spread the thin oar, and catch the driving gale.

What is the particular organization which enables this animal to riſe to the ſurface or to ſink to the bottom at pleaſure, ſeems not to be underſtood by naturaliſts; whether it is by throwing out a quantity of water by which it becomes ſpecifically lighter than the element in which it lives, or by taking in a quantity of air, which will produce the ſame effect. It is only when the ſea is calm and unruffled that the nautilus, with his feeble bark, appears on the ſurface. In riſing through the water, the ſhell is reverſed, the ſharp edge of the keel preſenting leſs reſiſtance to the liquid; and when it reaches the ſurface, the animal, by exerting its arms, reſtores it to a proper poſition for its voyage. A quantity of water is taken into the ſhell to balance it. The animal then employs its arms as oars; or if a gentle breeze ſweep the ſurface, it ſtretches two of them perpendicularly, by which means the membrane between them is extended in form of a ſail; the other arms ſerve as oars to direct the courſe, or to keep the bark ſteady, as well as part of the body which hangs over the ſhell, and ſeems to anſwer for a rudder. Thus equipped, the ſolitary navigator glides ſmoothly along the boſom of the ocean. But, on the approach of the ſmalleſt danger, the appearance of an enemy, or the ſlighteſt ruffling of the ſurface of the water, it inſtantly retires within the ſhell, and taking in a quantity of water, or ejecting a quantity of air, quick as thought it ſinks to the bottom. Mediterranean and Indian ocean.

vitreus. 2. A. keel of the ſhell toothed in the middle. The ſhell is conic, tranſverſely ribbed, with a convex keel; aperture oval. It is a very rare ſpecies.

cymbium. 3. A. keel of the ſhell wrinkled, and without teeth; depreſſed, thin, wrinkled, with fine longitudinal ſtriæ croſſing the wrinkles. Mediterranean.

cornu. 4. A. keel with 4 ſmooth elevated rings; 1 line high, 5 broad. Cape of Good Hope.

arctica. 5. A. ſhell perforated with an entire keel; 3½ lines diameter. Greenland ſeas, where it is frequently ſeen floating in ſpring and autumn.

Some ſpecies of the argonauta are met with in all climates from the Indian ocean to the ſhores of Greenland.

47 Nautilus.

Gen. 19. NAUTILUS.

Gen. Char.—The nature of the animal which inhabits this ſhell is not well known. The ſhell is univalve, divided into ſeveral compartments, communicating by an aperture with each other.

SPECIES.

A. *Spiral, rounded, with contiguous whorls.*

pompilius. 1. N. aperture of the ſhell heart-ſhaped; whorls obtuſe; ſmooth. Indian and African ocean.—This ſpecies is often very large, and it is finely variegated with brown flexuous ſtreaks, ſpots, and marks, under the epidermis, which is white; within it exhibits a beautiful pearly gloſs. It is employed for drinking cups by the inhabitants of the eaſt.

calcar. * 2. N. aperture of the ſhell linear; whorls with elevated joints; minute, white, opaque. Sheppey iſland.

criſpus. * 3. N. with lateral ſpires, with about 20 flexuous, crenated joints in the exterior whorl; marked by elevated ſtriæ; aperture ſemicordate; ſyphon central; very minute. Mediterranean, Sheppey iſland, and Sandwich.

beccarii. 4. N. aperture obovate; 4 or 5 volutions, with deep ſulcated joints; 10 in the firſt ſpire, frequent on moſt ſhores; minute.

perverſus. * 5. N. ſimilar to the preceding ſpecies, but with the ſpires reverſed. Shores of Britain, frequent.

levigatulus. * 6. N. ſpiral, with ſmooth joints; ſemipellucid, white, gloſſy; very minute. Sandwich.

depreſſulus * 7. N. ſpiral, ſlightly umbilicated on each ſide, with many depreſſed joints. Reculver, England. Very minute, and rare.

umbilicatulus. * 8. N. ſpiral, umbilicated, with furrowed joints; colour opaque, white. Sandwich. Minute, not common.

craſſulus. * 9. R. thick, ſpiral, doubly umbilicated, with fine joints; opaque, white. Reculver, England. Minute, rare.

lobatulus. * 10. N. ſpiral, lobate; ſpires rounded on one ſide, depreſſed on the other. Whitſtable.

carinatulus. * 11. N. oblong, carinated; aperture oval, narrow. Sandwich. Minute, rare.

ſubarcuatulus. 12. N. a little bending, with raiſed joints; length one-tenth of an inch.

lacuſtris. * 13. N. compreſſed, ſubcarinated, ſpiral, ſmooth, gloſſy, horn-coloured, with 3 viſible volutions; diameter one-fifth of an inch. Brooks, Kent; marſhes, Rotherhithe. Not unfrequent. *Lightfoot, Phil. Tranſ.* 76. *Helix nitida*, Lin. This is ſuppoſed to be the only ſpecies of freſh-water nautilus which has been deſcribed.

balthicus. 14. N. white, convex; aperture linear; firſt ſpire largeſt. Baltic.

helicites. 15. N. ſpires of the ſhells concealed; very ſmall. Found in a foſſil ſtate on St Peter's mountain at Maeſtricht.

rugoſus. 16. N. aperture linear; ſpires compreſſed, with thickened margins. Southern ocean. Very ſmall.

umbilicatus. 17. N. aperture compreſſed, linear; ſpires compreſſed; umbilicus concave; minute. Croatia.

B. *Spiral, rounded, with ſeparate whirls.*

ſpicula. 18. N. aperture orbicular; whirl cylindrical; one inch in diameter. American and Indian oceans.

ſpengleri. 19. N. ſmooth, with 4 conic tubercles; very minute. India.

unguiculatus. 20. N. diaphanous, middle partitions protuberant outwards; ſurface with ſix conic tubercles; minute. India.

C. *Elongated, and nearly ſtraight.*

ſemilituus. * 21. N. incurved, ſpiral at the tip; whirls contiguous; minute, convex; the partitions appearing outwardly. Croatia, Sandwich. Rare.

lituus. 22. N. ſubconic; globular diviſions growing gradually leſs; tip incurved, ſpiral. Red ſea. Frequently found foſſil.

obliquus. 23. N. with a ſlight curvature; diviſions obliquely ſtriated; ſyphon central. Mediterranean and Adriatic ſeas.

raphaniſtrum. 24. N. ſubcylindrical, with thick diviſions, marked with 12 elevated ſtriæ; ſyphon central. Adriatic and Mediterranean ſeas.

raphanus 25. N. jointed, diviſions thick, with 17 elevated ſtriæ; ſyphon ſublateral, oblique. Adriatic and Mediterranean.

granum. 26. N. ovate, oblong, with thick diviſions, marked with 8 interrupted elevated ſtriæ; ſyphon oblique; minute. Mediterranean.

radicula. * 27. N. oblong, ovate, with 8 or 9 ſubgloboſe articulations; aperture a ſmall ſyphon. Adriatic, Sandwich.

faſcia. 28. N. diviſions ſtriated; joints ſmooth, elevated; obtuſe at the tip; denticulated at the margin; ſyphon central. Adriatic. Very ſmall.

inæqualis. 29. N. cylindrical, with 8 diviſions; aperture margined; very minute. Red ſea.

ſiphunculus. 30. N. ſmooth, with cylindrical, remote diviſions; joints tapering, cylindrical. Seas of Sicily.

legumen. * 31. N. compreſſed, jointed, margined at one end; ſyphon lateral. Adriatic, Sandwich. Very rare.

coſtatus. * 32. N. ſtraight, ſubcylindrical, tapering; joints 12, raiſed, with 4 equidiſtant, ſtrong, longitudinal ribs the whole length; $\frac{1}{4}$ inch long. Coaſt of Kent. *Montagu, Teſt. Brit.* 199. A variety of this has been diſcovered with only 6 joints.

orthocera. 33. N. whirls of the ſhell with carinated ſtriæ. The ocean. Frequently found foſſil.

belemnita. 34. N. *Thunder-ſtone.* Equal, ſmooth, conic, acute; varies in ſize, from $\frac{1}{2}$ inch to 8 inches; found foſſil in moſt parts of Europe. It has ſome degree of tranſparency; and when burnt or rubbed, emits a ſmell like raſped horn.

48
Conus.

Gen. 20. Conus, *Cone-ſhell.*

Gen. Char.—The animal is a limax. The ſhell univalve, convolute, turbinate; aperture effuſe, longitudinal, linear, without teeth, entire at the baſe; pillar ſmooth.

SPECIES.

A. *Spire or turban nearly truncated.*

marmoreus. 1. C. conic, brown, with ovate, ſubangular, white ſpots; whirls of the ſpire channelled. American ocean.

imperialis. 2. C. whitiſh, with longitudinal, livid bands, and divided brown and white linear belts: ſpire flat, painted with brown undulated ſtripes, often emarginated. A rare ſhell.

literatus. 3. C. conic, white, with brown dots; ſpire marked with brown ſtripes. Aſiatic ocean.

generalis. 4. C. conic, poliſhed, with a pointed, muricated ſpire; whirls channelled. India.

virgo. 5. C. conic, with a bluiſh baſe. African ocean.

capitaneus. 6. C. conic, glabrous, with a brown baſe; ſpire a little convex, ſometimes flat, and generally ſtriped. Aſia.

tribunus. 7. C. white, with three yellowiſh bands; ſpotted with cheſnut: ſpire convex; baſe tranſverſely ſtriated.

miles. 8. C. conic, rough with a brown baſe: ſpire convex, India.

cingulum. 9. C. conic, yellowiſh, with a ſingle elevated belt in the middle: ſpire acute. Friendly iſlands.

B. *Pyriform with a rounded baſe; cylinder half as long again as the ſpire.*

princeps. 10. C. yellow, with purpliſh brown; longitudinal branched lines, marked with two white bands, which have a few brown ſpots: ſpire obtuſe and finely ſtriated tranſverſely: $2\frac{1}{2}$ inches long. Indies.

ammiralis. 11. C. with rough punctures at the baſe.—This ſpecies is divided into the following varieties. 1. Without bands. 2. With irregular bands. 3. With one regular band. 4. With two regular bands. 5. With three regular bands. 6. With four regular bands. 7. With five or more regular bands. 8. With punctated, reticulated belts. To this laſt diviſion belongs the *cedo nulli*, or celebrated admiral ſhell, which has been eſteemed the rareſt and moſt precious of teſtaceous productions. Some ſpecimens of the C. *cedo nulli* have brought the extravagant price of 100 guineas. The endleſs varieties of this ſpecies are found in the ſeas of South America.

vacarius. 12. C. teſtaceous, ſpotted with white; with four yellow, immaculate bands; the ſecond angularly divided. Southern ocean.

ſenator. 13. C. conic, ſmooth, glabrous; with obtuſe, ſculptured whirls: yellow ſpotted with white.

nobilis. 14. C. ſubcylindrical, ſmooth, glabrous; finely poliſhed; yellow or brown, ſpotted with white.

genuanus. 15. C. with linear belts, articulated with white and brown: red, with bands alternately teſſelated with brown and red.

glaucus. 16. C. emarginated at the baſe, ſtriated; ſpire unarmed, with contiguous whirls. India and Africa.

monochus. 17. C. gibbous, clouded with bluiſh brown; acute, ſtriated at the baſe; ſometimes dotted in rows.

minimus. 18. C. grayiſh, ſurrounded with oblong dots.

ruſticus. 19. C. ovate, rugged, and muricated at the baſe; ſpire conico-convex. Var. 1. Without band. 2. With a band clouded whitiſh. Africa.

mercator. 20. C. ovate, white, with reticulated yellow bands. Africa.

betulinus. 21. C. ſlightly emarginated at the baſe and wrinkled; ſpire flattiſh, mucronate. India. A large ſhell.

figulinus. 22. C. ſlightly emarginated at the baſe, and wrinkled; ſpire acuminated, with flattiſh whirls: three inches long. India.

ebræus. 23. C. ovate, white, with black band, compoſed of tranſverſe ſpots; a ſmall ſhell.

ſtercus muſcarum 24. C. emarginated at the baſe, and ſtriated: whirls of the ſpire channelled. Aſia.

varius. 25. C. elongated, muricated: the ſpire crowned and acute. Indian ocean.

achatinus. 26. C. elongated, finely ſtriated tranſverſely; variouſly clouded, and ſpotted with white: ſpire ſhort, ſpotted with brown, and tipt with red. American ocean.

radiatus. 27. C. with white rays and bands.

leoninus. 28. C. pale yellow or cheſnut ſpots, with white or yellow tranſverſe bands; ſpire rather acute.

jaſpideus. 29. C. light olive, with multifarious white dots, and an oblique band: oblong. Small.

nebuloſus. 30. C. brown with blue clouds and white ſpots.

oculatus. 31. C. conic, yellow, with white eyes and band: baſe obliquely ſtriated.

coffeæ. 32. C. ſhort, brown, with two white bands: that neareſt the ſpire ſpotted with brown.

amadis. 33. C. pale brown, with a broad band, and articulated belts above and beneath: ſpire acute, crowned with tubercles, and finely ſtriated tranſverſely.

fulmineus. 34. C. with cheſnut ſtripes the whole length: ſpire acute, and with the pillar lip ſpotted with cheſnut; the baſe acute and obliquely ſtriated.

arachnoideus. 35. C. reticulated with cheſnut, with two or three darker bands; ſpire crowned and acute. A very rare ſpecies.

coſtatus. 36. C. brown, with a white band; undulated with reddiſh, thick, and broad ſtriæ; ſpire nodulous, with a granulated band.

leucoſtictus. 37. C. white, clouded, ſtriped, and ſpotted with brown; with numerous rows of white and brown dots: ſpire crowned with tubercles. American ocean.

citrinus. 38. C. citron with black lines, interrupted beneath; ſpire crowned with tubercles, with the baſe white. Curaçoa.

inſularis. 39. C. white, with cheſnut clouds, ſpots, and dots; ſpire acute.

coronatus. 40. C. with alternate articulated belts and teſſelated ſpots; ſpire crowned with tubercles; ſhell often minute, and with a white band.

punctatus. 41. C. with two yellowiſh brown bands, and numerous lines of dots; ſpire varied with yellow dots and lines.

zeylanicus. 42. C. ſnowy, with roſy and brown clouds, and numerous articulated belts, varied with white and cheſnut; ſpire pointed.

ſolidus. 43. C. conic, thick, tranſverſely ſtriated; clouded with white and brown, with a broad white band, and pyramidal ſpire; whirls channelled.

C. *Elongated and rounded at the baſe; cylinder as long again as the ſpire.*

clavus. 44. C. with convex ſmooth ſtriæ; the baſe bluiſh. Indian ocean. Very rare.

nuſſatella. 45. C. ſubcylindrical, red, rough; ſtriæ tuberculated. Iſland of Nuſſatella in Aſia, but very rare.

terebellum. 46. C. white, ſhaded with blue; ſubcylindrical, with annular ſtriæ and yellow bands.

coccineus. 47. C. red, with tranſverſe lines, dotted with black; with a white band, and ſpire ſpotted with red.

lætus. 48. C. ſubcylindrical, with annular ribs; red, with darker clouds, and barred with white; ſpire ſpotted.

ochroleucus. 49. C. ſubcylindrical, yellow; the baſe obliquely ſtriated, with a white band near it; ſpire pointed with ſtriped ſpots.

lævis. 50. C. rufous with fulvous ſpots, and tranſverſe ſtriæ; ſpire ſpotted with yellow; baſe obliquely ſtriated.

affinis. 51. C. bluiſh white, with four fulvous linear bands, and intermediate dull purple dots.

violaceus. 52. C. white with violet clouds and bands; rays pale brown; ſpire pyramidal, with ſix whirls.

granulatus. 53. C. rough, unarmed, with ſmooth, grooved ſtriæ. African ocean. Shell red, with white bands, and purple linear dots.

polyzonias. 54. C. white within; outſide yellowiſh brown and rough, with fine granulated lines, with a white band at the ſpire denticulated beneath; another at the baſe with a paler tinge; ſpire flattened, with ſtriped ſpots; baſe outwardly duſky, and violet within.

bifaſciatus. 55. C. white, with angular cheſnut lines, and two orange bands; ſpire prominent; baſe ſurrounded with orange lines, and intermediate teſſelated ſpots.

niveus. 56. C. conic, ſnowy; ſpire prominent, and crowned with tubercles; aperture large.

arauſiacus. 57. C. *orange flag*, ſmooth, with whitiſh bands; whirls grooved at the tips. India.

magus. 58. C. ſubcylindrical, with longitudinal bands, dotted with white. India.

ſtriatus. 59. C. ovate, oblong, gibbous, clouded with fine parallel brown ſtriæ; 4 inches long. Africa.

textile. 60. C. with reticulated yellow veins, and yellow and brown ſpots. Aſia.

aulicus. 61. C. white, with brown reticular veins and interrupted longitudinal bands. Aſia. It varies much in its colours.

thomæ. 62. C. ſmooth, white, with bay characters and rows of dots, with three white belts and ſpots; the tip reddiſh; ſpire conic, with grooved whirls. Indian ocean.

D. *Ventricoſe in the middle, and contracted at each end.*

ſinenſis. 63. C. ventricoſe, yellow with white eyes; baſe tranſverſely ſtriated.

E. *Thin, ventricoſe, and tinkling when thrown upon its back on a table.*

ſpectrum. 64. C. bluiſh, with yellow clouds and yellowiſh thick dots and ſtriæ; ſpire rather acute. Aſiatic ſeas.

bullatus. 65. C. yellow clouded with white; aperture large and bluiſh; ſpire ſometimes flat, ſometimes acute.

tulipa. 66. C. oblong, gibbous, ſmooth; aperture gaping. India, South America.

geographicus. 67. C. oblong, gibbous, crowned; aperture gaping; wrinkled at the baſe, and a little narrower; aperture white; ſpire ſometimes roſy. Indian and African ſeas.

nubecula. 68. C. white, clouded and ſpotted with orange, with ſcattered white dots; ſpire prominent, acute.

ſpurius. 69. C. white, with alternate rows of irregular cheſnut, or blackiſh ſpots, and interrupted, punctured bands.

vexillum. 70. C. brown, ſhaded with white, with a white interrupted band; the white band is ſometimes cruciate.

ventricoſus. 71. C. brown, barred with white, beneath narrower, ſhaded with bluiſh, and ſmooth; ſpire conic, exſerted.

Gen. 21. CYPRÆA, *Cowrie.*

49 Cypræa.

Gen. Char.—The animal is a ſlug; ſhell univalve, involute, ſubovate, ſmooth, obtuſe at each end; aperture effuſe at each end; linear, extending the whole length of the ſhell, and toothed on each end.

SPECIES.

exanthema. 1. C. ſlightly turbinated, ferruginous, with whitiſh round ſpots and eyes; line down the back a little branched. American and Atlantic ſeas.

mappa. 2. C. ſlightly turbinated, and marked with irregular characters; line down the back branched. Indian and African ſeas.

arabica. 3. C. ſlightly turbinated with irregular characters; ſtripe down the back ſimple. India.

argus. 4. C. ſlightly turbinated, ſubcylindrical, ſprinkled with eyes; beneath 4 brown ſpots; about 4 inches long. Indian and Atlantic ſeas.

teſtudinaria. 5. C. obtuſe, ſub cylindrical; extremities depreſſed. Perſian gulf and Indian ocean. This is the largeſt ſhell of this genus.

ſtercoraria. 6. C. ſlightly turbinated, gibbous, with livid and teſtaceous ſpots; emarginate on each ſide, and flat beneath. Guinea.

carniola. 7. C. ſlightly turbinated, pale, with fleſh-coloured bands; mouth violet; 2½ inches long. Aſiatic ocean.

zebra. 8. C. turbinated, cinereous, with brown bands; is twice as large as the laſt, and the ſpire more prominent. India.

talpa. 9. C. ſlightly turbinated, ſub-cylindrical, teſtaceous, with pale bands; beneath thickened and brown; 3 inches long. India.

amethyſtea. 10. C. ſlightly turbinated; ſides gibbous and decorticated, 4 clouded, browniſh bands above. Madagaſcar.

lurida. 11. C. ſlightly turbinated, lurid and ſlightly barred; extremities pale yellow, with 2 black ſpots. Mediterranean and Atlantic ſeas.

venelli. 12. C. ſlightly turbinated, ſpotted, and marked with yellowiſh dots; extremities ſpotted with brown; throat rufous.

lota. 13. C. ſlightly turbinated, white, with ſubulate denticles. Sicily.

fragilis. 14. C. turbinated, ovate, glaucous, with longitudinal teſtaceous waves, and pale bands. Mediterranean.

guttata. 15. C. thin, gibbous, fulvous, dotted with white, with a horizontal line in the middle; beneath white with yellow teeth.

cinerea. 16. C. thin, ventricoſe, reddiſh gray, with paler bands.

plumbea. 17. C. ſlightly turbinated thin; back lead colour, with four bands varied with blue and brown; undulated with browniſh at the margin, and marked with blue and brown lines. Guinea.

oculata. 18. C. ſlightly turbinated, ruſſet brown, with white eyes, and three paler bands on the back. American ocean.

hiſtrio. 19. C. ovate, ſlightly turbinated, with livid eyes; beneath flat, white; ſides thickened, black, ſpotted with brown. Indian ocean.

aurantium. 20. C. ſlightly turbinated, orange, with a white immaculate edge; throat bright red. Friendly iſlands.

ferruginoſa. 21. C. thin, elongated, yellowiſh or bluiſh, with ferruginous ſpots; within blue.

livida. 22. C. thin, elongated, uniformly ſtraw-coloured, pale yellow or reddiſh; beneath dotted with brown; teeth ſubulate.

gibba. 23. C. thin, gibbous; back clouded, and tranſverſely barred.

turbinata. 24. C. turbinated, ovate, glaucous, with angular pale ſpots.

venerea. 25. C. oblong, brown, with ſtriped gold ſpots; within blue.

purpuraſcens. 26. C. oblong, purpliſh; beneath ſurrounded with a white line.

albida. 27. C. oblong, whitiſh; ends of the lips ſpotted with fulvous.

rufeſcens. 28. C. oblong, reddiſh brown; beneath whitiſh.

tranſlucens 29. C. cylindrical, cinereous with pellucid bands.

punctulata 30. C. cylindrical, fragile, white, with tranſverſe bands of reddiſh dots.

31. C. obtuſe, ovate, ſlightly turbinated with a longitudinal teſtaceous line. *tigrina.*

32. C. oblong, ferruginous, with paler bands. *dubia.*

33. C. turbinated, thin, bluiſh brown, with three yellowiſh bands varied with brown at each end. Rare. *trifaſciata.*

34. C. turbinated, bluiſh, white, dotted and clouded with brown. *conſpurcata.*

35. C. oblong, ſhaded with purple, with a ſtraw-coloured band, and another narrower white one, and a brown border; 4 inches long. *bifaſciata.*

36. C. cylindrical, above; pale-violet, and ſpotted with brown at the ſides, with two brown ſpots at each end. *cylindrica.*

37. C. cylindrical, milk-white; one ſide bordered and varied with a few pale-yellow, narrow marks, backed with three browniſh waved bands. *teres.*

38. C. ovate, a little depreſſed; one ſide ſlightly bordered; back whitiſh, with crowded yellowiſh brown dots and waves, and 3 obſolete darker bands; 1½ inch long, ¾ broad. *ovata.*

39. C. oblong, of one colour, with a tinge of bloom; beneath dotted with white, with the border of one ſide and the teeth of the lip white; above yellow at each end; ſpire tipt with black. *minuta.*

40. C. thin, oblong, barred with brown, and dotted with red at the ſides. *ſanguinolenta.*

41. C. turbinated, glaucous, margined; above gibbous, with tranſverſe browniſh bands; throat glaucous. *faſciata.*

42. C. gibbous, glaucous, brown, with triangular, teſtaceous and whitiſh ſpots, and 3 tranſverſe bands; throat blackiſh, glaucous. *regina.*

43. C. turbinated, undulated with browniſh, clouded with pale ochre; and deeper bands. Mauritius iſland. *undulata.*

B. *Obtuſe, and without a manifeſt ſpire.*

44. C. triangularly gibbous, and rather obtuſe behind; brown, ſpotted and white; beneath white; 1½ inch long. Mauritius and Nuſſatella iſlands. *caputſerpentis.*

45. C. roundiſh, gibbous, brown, with white, confluent, reticulated eyes, and a white horizontal line in the middle of the back; beneath white. *reticulum.*

46. C. triangularly gibbous; behind depreſſed, acute; beneath black; a large ſhell, ſpotted with brown. Java, Mauritius, and Nuſſatella. *mauritiana.*

47. C. livid, with ſmall white ſpots; 2 inches long. Indian ocean. *vitellus.*

48. C. retuſe, gibbous, cinereous, with a longitudinal brown band; teeth of the aperture blackiſh. American and Mediterranean ſeas. *mus.*

49. C. ovate obtuſe behind, and rounded before; ferruginous, with deep brown ſpots, and a yellow longitudinal, dorſal line; 4½ inches long. Indian ocean. *tigris.*

50. C. ovate, obtuſe behind, and rounded before, with waved yellow ſpots; a rare ſhell. *flammea.*

51. C. ovate, olive, clouded with yellow, and ſpotted with brown; beneath flat, pale brown: teeth of the lip white. *olivacea.*

52. C. ovate, thin, white, with greeniſh yellow dots, diſpoſed in rows; within violet. *feminea.*

53. C. oblong, ovate, with brown dots, and a yellowiſh line; hind part a little acute, with a rufous mouth; 2 inches long. Madagaſcar. *lynx.*

54. C.

iſabella. 54. C. ſub-cylindrical, with pale yellow extremities; 1½ inch long. Mauritius.

ambigua. 55. C. pyriform, duſky, with paler clouds and ſpots.

ſcurra. 56. C. ovate, oblong; beneath flat; yellowiſh, with greeniſh and livid confluent drops; ſides varied with ſcattered brown dots. India.

C. *Umbilicated or perforated.*

onyx. 57. C. beneath brown, above whitiſh; ſmall. Aſia.

clandeſtina. 58. C. with fine tranſverſe lines here and there meeting together. India.

ſuccincta. 59. C. interior lip rounded at each extremity.

zig-zag. 60. C. pale yellow, with brown dots; the extremities with 2 brown ſpots.

hirundo. 61. C. above bluiſh; extremities marked with 2 brown ſpots. Maldivia iſlands.

aſellus. 62. C. white, with 3 brown bands; oblong; minute. Madeira iſlands.

erronea. 63. C. with an equal teſtaceous ſpot.

urſellus. 64. C. oblong, white; above ſmooth, varied with brown, and marked with 2 brown dots at the umbilicus or perforation.

pyrum. 65. C. pale brown, with paler bands and ochraceous ſpots; beneath and at the ſides fulvous; within blue.

maculoſa. 66. C. narrow, long, with fleſh-coloured ſpots above, varied with pale, fulvous, and glaucous ones; ſides cheſnut.

pulla. 67. C. thin; ſides ruſſet brown; above white, or pale brown, with tranſverſe bands, or a fainter horizontal line.

indica. 68. C. cylindrical, marked above with characters, eyes, and a paler horizontal line; ſides bloom-colour, dotted with black. India.

ovum. 69. C. thin, oblong, olivaceous, with ſcattered ferruginous ſpots; beneath white.

felina. 70. C. oblong, narrow, plumbeous with ferruginous dots and ſpots, and paler bands; marked at each extremity with 2 brown ſpots.

atomaria. 71. C. oblong, ſnowy, dotted with brown; each end marked with 2 duſky dots; ½ inch long.

nebuloſa. 72. C. oblong, gibbous; brown, with cheſnut ſpots.

ochroleuca. 73. C. thin, ochraceous, with paler ſpots.

ſtellata. 74. C. thin, cinereous, dotted with brown, and marked with tranſverſe, elevated ſtriæ.

ſubflava. 75. C. oblong, gibbous, ſmooth, yellowiſh.

leucogaſter. 76. C. oblong, purple; beneath white.

varioloſa. 77. C. oblong, duſky, with two bands on the back, and whitiſh ſpots.

fulva. 78. C. ſolid, oblong, fulvous, with brown ſpots, diſpoſed in rows, and two duſky bands; ſides ſaffron.

leucoſtoma. 79. C. oblong, gibbous; clouded with brown and blue; ſides ſpotted with black; mouth white.

lineata. 80. C. ovate, marked above with lines; borders ſpotted.

cancellata. 81. C. ovate, gibbous, with cancellated ſpots, and a horizontal line above.

lutea. 82. C. browniſh, with two white bands; beneath pale yellow, dotted with brown.

badia. 83. C. oblong, gibbous; above bay, with brown and white dots.

punctata. 84. C. ovate, white, with teſtaceous dots.

zonaria. 85. C. ovate, ſmoothiſh, yellowiſh, with four brown lunules. Shores of Guinea. Very rare ſhell.

86. C. lip toothed within; with three rows of tubercles; pillar lip without teeth. *conoidea.*

D. *Margined.*

87. C. umbilicated, pale yellow, with white round ſpots. *cribraria.*

88. C. whitiſh, with a knotty margin. Mediterranean, Atlantic, Ethiopic, and Indian ſeas.—This ſpecies is collected in great quantities, and tranſported to Bengal, Siam, and other parts of India, where it is employed by the natives as the medium of commerce. *moneta.*

89. C. ſurrounded on the back with a yellow ring. Amboyna and Alexandria. *annulus.*

90. C. gibbous, unequal, whitiſh; margin dotted with brown; back marked with teſtaceous clouds. Indian ocean. *caurica.*

91. C. with a jagged margin; yellow, dotted with white; ſides with a browniſh ſpot. Mauritius and Aſcenſion iſlands. *eroſa.*

92. C. with a jagged margin, fleſh-colour, with a greeniſh back, marked with fulvous dots; ſides dotted with brown. Mediterranean. *dcroſa.*

93. C. with a jagged margin; yellow, dotted with white; ſides marked with obſolete, ſcattered, brown dots. *flaveola.*

94. C. ſlightly margined, yellowiſh with deeper ſpecks; ſides dotted with brown. Mediterranean. *ſpurca.*

95. C. oblong, ovate; above bluiſh, dotted and ſpotted with brown; beneath and at the ſides white. *oblonga.*

96. C. cinereous, variegated with teſtaceous; white beneath, and at the ſides; 1½ inch long. Amboyna. *ſtolida.*

97. C. triangularly gibbous, dotted with white, jagged behind; beneath yellow, immaculate. Indian ocean. *helvola.*

98. C. ſlightly margined, pale yellow with black eyes; margin white, dotted with brown; 1½ inch long. *ocellata.*

99. C. pale violet, dotted with white; a very ſmall ſhell. *poraria.*

* 100. C. with numerous tranſverſe furrows, ſome of which are forked; a ſmall ſhell, and ovate, with various tints of red or white; ſometimes it is marked with a longitudinal groove. Frequent on moſt ſhores. Britain. *pediculus.*

101. C. margined on each ſide, ſlightly produced and rugged, with raiſed tubercles above; 1 inch long. Nuſſatella iſland. *nucleus.*

102. C. whitiſh, produced on each ſide; back tuberculated, and marked with tranſverſe undulated ſtriæ. Madagaſcar. *madagaſcarienſis.*

103. C. ſomewhat produced, with elevated dots; extremities pale yellow. *ſtaphylæa.*

104. C. produced on each ſide, and ſprinkled with raiſed dots. Mediterranean and Indian ſeas. *cicercula.*

105. C. produced on each ſide, and ſmooth, white or yellow. Amboyna. *globulus.*

106. C. oblong, ſlightly produced, ſmooth, yellow; ocellated on each ſide before. *affinis.*

107. C. thin, oblong, white, with ferruginous ſpots and dots. *ſqualina.*

108. C. white or gray, with obſolete ferruginous ſpots and tranſverſe bands; lips of the mouth marked with violet ſpots. *fimbriata.*

cruenta. 109. C. gibbous; above bluiſh with rufous dots, beneath and at the ſides white; lips citron.

reticulata. 110. C. reticulated; margin varied with ſtriped ſpots.

rubiginoſa. 111. C. oblong, white; within violet; back with a ferruginous blotch; each end marked with two pale yellow ſpots; teeth of the lips yellowiſh.

miliaris. 112. C. thin, ſhort, yellowiſh green, with milk-white eyes, and marked with a lateral horizontal line.

acicularis. 113. C. ſolid; above yellowiſh dotted with brown, with a horizontal pale line; beneath milk-white, with impreſſed dots at the margin.

craſſa. 114. C. thick, yellowiſh, with 3 whitiſh bands; mouth bluiſh; 4 inches long.

vinoſa. 115. C. above white, with a claret ſtain, and marked with purple eyes, ſurrounded with a black circle, and a horizontal white line; blue within. Mediterranean.

anguſtata. 116. C. narrow, brown, with reddiſh ſpots at the ſides.

ſimilis. 117. C. oblong, gibbous, yellowiſh, dotted with white, with a blackiſh ſpot at the margin.

ſtriata. 118. C. convex, bluiſh white, dotted with brown; beneath yellow, ſtriated on one ſide.

ſinenſis. 119. C. oblong, ſolid, variegated with orange lips.

puſilla. 120. C. bluiſh, ſpotted with brown, and marked with 3 bands.

Gen. 22. BULLA, *Dipper.*

50 *Bulla.* *Gen. Char.*—The animal a limax; the ſhell univalve, convoluted, unarmed with teeth; aperture a little ſtraitened, oblong, longitudinal, very entire at the baſe; pillar oblique, ſmooth (B).

SPECIES.

ovum. 1. B. ovate, obtuſe, ſlightly doubly beaked; one of the lips toothed, from which it has the appearance of a cypræa; 4 inches long. Amboyna and Friendly iſlands.

volva. 2. B. two-beaked; the beaks long, ſtriated and acute. Jamaica. A rare ſhell.

biroſtris. 3. B. two-beaked, margin thickened outwardly; beaks long, ſmooth; ſize of a bean. Java.

ſpelta. 4. B. oblong, rather obtuſe at both ends; equal; lip arched; margin thickened within; twice the ſize of a grain of wheat. Mediterranean and Adriatic.

verrucoſa. 5. B. tranſverſely angular, ovate, with a bony dot on each ſide. India.

gibboſa. 6. B. angular, with an elevated belt. Brazil.

naucum. 7. B. rounded, pellucid, ſlightly ſtriated tranſverſely; perforated at each end; an inch long. African and Indian ſeas.

aperta. * 8. B. roundiſh, pellucid, tranſverſely ſub-ſtriated; outſide a little wrinkled; gloſſy; one inch long. Europe, Africa, Devonſhire.

hydatis. * 9. B. rounded, pellucid, ſlightly ſtriated longitudinally; crown umbilicated; ſize of a pea. Mediterranean, Devonſhire.

ampulla. * 10. B. rounded, obtuſe at one end; crown umbilicated. Frequent on moſt ſhores; Britain.

lignaria. * 11. B. oblong, oval, tranſverſely ſtriated; crown narrow, and ſlightly umbilicated; 3 inches long. European ſhores, Britain.

regulbienſis. * 12. B. thick, white, opaque; aperture compreſſed in the middle; minute. Reculver, England.—*Bulta ſis. obtuſa*, Montagu, Teſt. Brit. 223.

phyſis. 13. B. rounded, glabrous, pellucid, marked with tranſverſe lines; ſpire retuſe. India.

ampluſtra. 14. B. roundiſh; ſpire elevated, obtuſe, with fleſh-coloured bands; ſhell white. Aſia.

ficus. 15. B. obovate, with a clavated crown, indiſtinct ſpire, and elongated beak; ſurface marked with reticulated ſtriæ; 3 inches long. American and Indian oceans.

rapa. 16. B. rounded, turbinated, ſlightly ſtriated, with a curvated beak, and finely wrought ſpire; from 2 to 3 inches long. Indian ocean.

canaliculata. 17. B. cylindrical; whirls of the ſpire grooved.

conoidea. 18. B. oblong, turbinated, ſmooth; baſe a little ſtriated; ſutures crenulated; ſize of an acorn.

fontinalis. * 19. B. ovate, pellucid; ſpire obſolete; whirls contrary, or turning from right to left; aperture ovate, oblong, $\frac{1}{2}$ inch long. Shores of the Danube; lakes and rivers of Europe; Britain.

hypnorum. * 20. B. ovate, pellucid; ſpire contrary, prominent; aperture ovate, lanceolate. Europe, Britain.—Linnæus ſuppoſes that this ſpecies may be a variety of the laſt; but, according to Mr Montagu, the form of the ſhell, the ſtructure of the animal, and its *habitat*, are always diſtinct. Linnæus ſays, that this ſpecies is found among wet moſs. Mr Montagu found it only in ditches, and in a place occaſionally overflowed by the river Avon.

turrita. 21. B. poliſhed, with a pointed ſpire; aperture oblong. Northern Europe, in ditches and wet weadows.

gelatinoſa. 22. B. brittle, with a depreſſed contrary ſpire; aperture ending in a beak; $2\frac{1}{2}$ lines long. Rivers of Denmark.

terebellum. 23. B. ſides cylindrical, with a ſubulate ſpire, truncated at the baſe; 2 inches long. Indian ocean.

cypræa. 24. B. ovate; ſpire indiſtinct, prominent at the top; aperture more dilated behind; pillar twiſted; ſize of an acorn. Mediterranean.

virginea. 25. B. with party-coloured double bands, and purple truncated pillar: aperture ſemilunar. Rivers of Aſia.

faſciata. 26. B. conic, pointed with tranſverſe bands and undulated ſpots; aperture white. South America, India.

ſtrigata. 27. B. conic, pointed, glabrous, with undulated fulvous ſtreaks; 2 inches long; 8 whirls in the ſpire.

ſtriatula. 28. B. conic, white, ſtriated; pillar ſtraight and reflected.

exarata. 29. B. oblong, pointed, white, grooved; ſpire with 6 or 7 whirls.

bifaſciata. 30. B. tapering, erect; white, with 2 broad, reddiſh bands at the aperture; a land ſpecies.

31. B.

(B) In ſome of the ſpecies belonging to this genus, it appears that the animal poſſeſſes different characters from thoſe of the limax, and particularly that which inhabits the bulla lignaria, a Britiſh ſhell, which is furniſhed with a gizzard, of a teſtaceous nature. See Lin. Tranſ. vol. ii. p. 15.

ambigua. 31. B. a little tapering and compreſſed; pale, fleſh-coloured, with two remote bands; one broader and brown, the other blue.

zebra. 32. B. ovate, pointed, with longitudinal brown bands; pillar inflected, entire. Tranquebar. A land ſpecies.

achatina. 33. B. ovate, pointed, with a wide crimſon mouth and lip; pillar truncated; 8 inches long. American ocean.

hyalina. 34. B. oblong, horn-coloured; ſpire retuſe; thin; ½ inch long.

ovata. 35. B. ſubovate, ſlightly two-beaked; ſtriated on the back, and gibbous in the middle; cheſnut with white ſpots and bands; within violet.

ferruginoſa. 36. B. ſub-ovate, equable, pale gray, undulated with brown, and marked with ferruginous ſpots, and two white bands; 1½ inch long.

velum. 37. B. thin, umbilicated on each ſide; white, with capillary brown lines, and a ſnowy band, edged with brown on each ſide; 1 inch long.

veſica. 38. B. ovate, oblong, within milk-white, ſolid, pellucid; aperture wide; two grooves on the back. Brazil.

cylindrica. * 39. B. cylindrical, ſmooth, white, thin, ſlightly umbilicated; twice as large as a grain of wheat. Europe, Britain.

oliva. 40. B. cylindrical, aperture ſub-orbicular, and dilated beneath.

voluta. 41. B. ſmooth, cylindrical, olive; aperture effuſe; pillar inflated, truncated; 7 whirls in the ſpire.

dominichenſis. 42. B. ſub-cylindrical, ſpiral, reddiſh, with longitudinal ſtriæ, and ſpotted; ſutures crenulated; pillars ſinuated and truncated. St Domingo.

purpurea. 43. B. ventricoſe, rugged, and longitudinally ſtreaked; aperture ovate, with a pointed lip, and deep black border within. Africa, in rice fields.

ſpreta. 44. B. ovate, thin, brown, and rough.

ſolida. 45. B. ſolid, red, varied with violet; margin red; ſpire a little prominent.

ſtercus-pulicum. 46. B. inflated, glabrous, horny; cinnamon colour; five rows of dots; pillar ſinuated, with an acute lip; extremity thin and ovate.

ſcabra. 47. B. ovate, rough, ſlightly carinated on the back, and marked with decuſſated ſtriæ; white with roſy lines; pillar ſcalloped, reflected. Java.

akera. * 48. B. ovate, pellucid, with a truncated, channelled crown; 6 lines long. Norway ſeas, Banff in Scotland, and near Portſmouth.

ſoluta. 49. B. cylindrical, horny, tranſverſely ſtriated, with a retuſe top or crown; whirls margined, channelled.

carnea. 50. B. ovate, fleſh-coloured, gibbous; lip arched, thickened and toothed within. Shores of Africa.

patula. * 51. B. ſmooth, gloſſy, white, pellucid, oblong, involuted; aperture large, terminating in a ſhort canal, moſt contracted at the top; length 1 inch. Weymouth.

haliotoidea. * 52. B. ſub-oval, thin, pellucid, white, reſembling a haliotis; a little wrinkled; aperture oval; length ¾ inch. Weymouth.

plumula. * 53. B. ovate, oblong, depreſſed, pellucid, thin; ſtrongly wrinkled concentrically; length ½ inch. Milton ſands, Devonſhire. *Montagu*, *Teſt. Brit.* p. 214.

catena. * 54. B. pellucid, white, finely ſtriated tranſverſely; the ſtriæ, magnified, have the appearance of the links of a chain; one-tenth inch diameter. Devonſhire.

umbilicata. * 55. B. oblong; oval, ſmooth, white; apex rounded, umbilicated; aperture very narrow; ⅛ inch long. Falmouth.

truncata. * 56. B. ſub-cylindrical, opaque, white; upper part longitudinally ſtriated, lower plain; apex truncated, and largely umbilicated. Falmouth.

diaphana. * 57. B. ſmooth, gloſſy, pellucid, white, ſuboval; body large, ventricoſe; apex pointed; aperture ſub-oval; ⅝ inch long. Salcomb bay. Rare.

Gen. 23. Voluta, *Volute*. 51 Voluta.

Gen. Char.—The animal a limax; the ſhell is one-celled, ſpiral; aperture without a beak, and ſometimes effuſe; pillar twiſted or plaited, generally without lips or perforation.

Species.

A. *Aperture entire.*

auris-midæ. 1. V. contracted, oval, oblong, with a rugged ſpire; pillar 2-toothed; 4 inches long. India. In marſhy woods and ſwamps.

flammea. 2. V. oval, oblong, with a wide aperture; pillar one-toothed.

ſulcata. 3. V. contracted, oblong, oval, grooved; white dotted with yellow; pillar with two plaits; ¾ inch long.

bifaſciata. 4. V. thin, tranſverſely ſtriated, fleſh-colour, with two white bands; pillar one-toothed; not one inch long.

flava. 5. V. contracted on the upper part; yellow, with a crenulated lip; pillar with two plaits; 4½ lines long.

minuta. 6. V. oval, oblong, banded; pillar with three plaits.

puſilla. 7. V. thin, brown; whirls of the ſpire cancellated; pillar three-toothed; very minute.

glabra. 8. V. oval, oblong, glabrous, with a reflected grooved lip; pillar one-toothed.

auris-ſileni 9. V. oval, gibbous, umbilicated; pillar with one thick, flexuous plait; two inches long.

auris-judæ. 10. V. contracted, oblong; ſpires ſmooth; pillar 3-toothed. Fens of India.

auris-malchi. 11. V. fuſiform, granulate, with an ovate aperture; pillar cut, ſpreading; three inches long. New Caledonia.

tornatilis. * 12. V. oval, pointed at each end, and ſpirally ſtriated; pillar with a ſingle fold: ¾ inch long. Europe, Wales.

ionenſis. * 13. V. thin, brittle, with two ſmall ſpires; mouth rounded, wide. Iſland of Iona, Scotland.

alba. * 14. V. white, opaque, longitudinally ſtriated. Sandwich. Very minute.

ſolidula. 15. V. contracted, oblong, ovate, opaque, ſtriated; ſpire elevated and a little pointed; pillar ſlightly plaited.

livida. 16. V. contracted, ovate, cylindrical; ſpire a little elevated, obtuſe; pillar with five plaits; one inch long. Africa.

coffea. 17. V. contracted, ſmooth, with an obtuſe ſpire; aperture toothed on each ſide.

B. *Subcylindrical, emarginated.*

porphyria. 18. V. ſmooth; ſpire obliterated at the baſe; lip retuſe in the middle; pillar obliquely ſtriated; five inches long. Brazil.

oliva. 19. V. ſmooth; ſpire reflected at the baſe; pillar obliquely ſtriated. Indian ſeas.

annulata. 20. V. ſmooth, white, with a keel-ſhaped ring on the back; ſometimes with reddiſh waves.

utriculus. 21. V. elongated, ſmooth, with a prominent ſpire. Indian and Ethiopic ſeas.

hiatula. 22. V. thin, with a cinereous ſpotted back, callous beneath; aperture large; pillar toothed at the baſe. Shores of Spain.

jaſpidea. 23. V. white dotted with greeniſh brown, or violet; ſpire prominent; whirls with a band compoſed of ſpots at the baſe; an inch long. Shores of Spain.

nivea. 24. V. ſnowy, elongated, ſmooth, banded. Spaniſh ſeas.

iſpidula. 25. V. ſmooth with a prominent ſpire and ſingle margin; pillar obliquely ſtriated; from one to two inches long. India.

carniolus. 26. V. orange with blue bands; ſpire flattened; aperture white.

C. *Obоval, effuſe, emarginated.*

dactylus. 27. V. ſmooth, with decuſſated ſtriæ, obtuſe; pillar with ſix plaits: $\frac{1}{2}$ inch long. India.

miliaria. 28. V. ſlightly emarginated, white, with an obliterated pale yellow ſpire; pillar obliquely ſtriated. Mediterranean.

monilis. 29. V. entire white with an obliterated white ſpire; pillar obliquely ſtriated; $1\frac{1}{2}$ inch long. China; where it is employed for making beads and necklaces. A variety is found in Africa only $2\frac{1}{2}$ lines long, with 8 or 10 thin plaits in the pillar.

exilis. 30. V. obovate, entire, yellowiſh, with two brown bands; ſpire prominent; pillar obliquely ſtriated.

perſicula. 31. V. ſmooth, with a retuſe umbilicated ſpire; pillar with ſeven plaits; lip with a crenated margin: one inch long. African ſea.

pallida. * 32. V. ſhell entire, oblong, ovate, with an elevated ſpire; pillar with four plaits. African and European ſhores, Britain.

faba. 33. V. ſlightly emarginated, ſmooth, a little plaited; ſpire prominent; pillar with four plaits; lip with a crenulated margin; one inch long. African ocean.

glabella. 34. V. very entire, ſmooth, with a levigated ſpire; pillar with four plaits; lip gibbous; margin toothed: from one to two inches long. African and American ſeas.

prunum. 35. V. very entire, ſmooth, with a levigated ſpire; pillar with four plaits; lip without tooth, or margin; $1\frac{1}{2}$ inch long. Iſland of Goree.

reticulata. 36. V. with ſlight decuſſated grooves; lip internally ſtriated; pillars ſlightly perforated; two inches long. American ocean and Guinea.

mercatoria 37. V. ſtriated, with an obtuſe ſpire; pillar retuſe, toothed; lip gibbous, denticulated; $\frac{3}{4}$ inch long. Mediterranean, American, and Indian ſeas.

ruſtica. 38. V. ſmooth with a prominent ſpire; pillar retuſe, toothed; lip gibbous, denticulated. Mediterranean and American ſeas.

paupercula 39. V. entire, ſmooth, with a ſtriated baſe; ſpire a little prominent; pillar with four plaits; lip obtuſe. Mediterranean and Indian ſeas.

mendicaria 40. V. ſlightly ſtriated, with a ſlightly granulated ſpire; pillar ſmooth; lip gibbous and denticulated; ſize of a kidney bean. Mediterranean and Indian ſeas.

cancellata. 41. V. entire, plaited, and croſswiſe reticulated; pillar with three plaits, ſlightly umbilicated, and a little produced. African ocean.

elegans. 42. V. ſmooth, white, with blue bands and yellow mouth; ſpire nearly obliterated; pillar ſix-toothed; ſcarcely one inch long.

ovum. 43. V. ſmooth, greeniſh white, with numerous bands; lip inflected; pillar with four plaits; $2\frac{3}{4}$ inches long.

marginata. 44. V. ſpire obſolete; ſides with thickened margins; four plaits in the pillar.

nucea. 45. V. ſubſtriated, glabrous; ſpire obtuſe, ſmooth, prominent; five plaits in the pillar. Indian ocean.

conus. 46. V. conic, white, with hollow punctured grooves at the baſe; whirls crenated; ſix plates in the pillar.

D. *Fuſiform.*

tringa. 47. V. nearly entire, oblong, ſmooth, with a prominent excoriated ſpire; three plates in the pillar; lip ſlightly toothed inwardly. Mediterranean.

cornicula. 48. V. ſlightly emarginated, oblong, ſmooth; ſpire longiſh; four plaits in the pillar; lip equal and unarmed. Mediterranean.

virgo. 49. V. entire, tapering, plaited and tranſverſely ſtriated; three plaits in the pillar, which is perforated. About a finger's length, and marked with about twelve grooves.

ſcabriuſcula. 50. V. emarginated, ſtriated, and tranſverſely wrinkled; four plaits in the pillar, which is perforated; lip notched; two inches long. India.

ruffina. 51. V. nearly entire, tranſverſely wrinkled; four plaits in the pillar; lip crenulated. India.

nubila. 52. V. nearly entire, ſmooth, yellowiſh with red clouds tranſverſely ſtriated; lip crenulated; four plaits in the pillar. Friendly iſlands.

ſanguiſuga 53. V. emarginated, longitudinally grooved and tranſverſely ſtriated; lips ſmooth; four plaits in the pillar; $1\frac{1}{2}$ inch long. Mediterranean and Indian ſeas.

caffra. 54. V. emarginated, round, ſmooth; whirls of the ſpire with plaited ſtriæ; four plaits in the pillar; $2\frac{1}{2}$ inches long. Aſiatic ſea.

morio. 55. V. ſlightly emarginated, round, ſmooth; about three plaits in the pillar.

acus. 56. V. tapering, marked with tranſverſe rays of red dots; ſpire pointed, ſmooth: ſcarcely an inch long.

vulpecula. 57. V. emarginated, ſubangular, unarmed, and tranſverſely ſtriated; four plaits in the pillar; throat ſtriated; two inches long. India.

piſcaria. 58. V. emarginated, angular, anterior angles a little ſpinous; four plaits in the pillar; lip ſmooth; two inches long. Indian ocean.

bullata. 59. V. cylindrical, glabrous, reddiſh, with ſublivid belts; four plaits in the pillar within; aperture effuſe. Indian ocean.

crenulata, 60. V. cylindrical with decuſſated ſtriæ, and impreſſed dots; white with yellowiſh clouds; lip and whirls nodulous; margin of the whirls crenulated; eight plaits in the pillar. Indian ocean.

ſcutulata. 61. V. tapering, black with white ſpots, tranſverſely ſtriated, firſt whirl a little ventricoſe; four plaits in the pillar. Indian ocean.

nigra. 62. V. tapering, emarginated, blackiſh; whirls flattiſh; four plaits in the pillar. Guinea, Greenland.

ſubdiviſa. 63. V. tapering, emarginated, longitudinally ribbed, plaited, and tranſverſely ſtriated; three plaits in the pillar. Indian ocean.

cruentata. 64. V. tapering, emarginated, barred and tranſverſely ſtriated with longitudinal knotty ribs, ſpotted with red; pillar with three plaits. Indian ocean.

exaſperata. 65. V. tapering, emarginated, granulous, with decuſſated ſtriæ and longitudinal ribs barred with brown; five plaits in the pillar. Indian ocean.

granoſa. 66. V. tapering, emarginated, tranſverſely ſtriated and longitudinally grooved, with elevated dots and reddiſh lines; three plaits in the pillar. Indian ocean.

caſta. 67. V. tapering, ſmooth, brown with white bands; ſix plaits in the pillar, which is emarginated at the baſe. Shores of Amboyna.

leucogonias. 68. V. tapering, cheſnut, with flexuous white bands; pillar obſoletely plaited: two inches long.

maculoſa. 69. V. tapering, white with reticulated and ſpotted brown bands: one inch long.

noduloſa. 70. V. tapering, brown, cancellated; angles of the ſection nodulous, and whitiſh: four plaits in the pillar.

ſpadicea. 71. V. tapering, cheſnut with yellow clouds and ſpots; eight whirls in the ſpire, which are longitudinally plaited and tranſverſely ſtriated; five plaits in the pillar.

aurantia. 72. V. tapering, orange; a white band in the four firſt whirls of the ſpire; lip denticulated; four plaits in the pillar.

decuſſata. 73. V. tapering, with decuſſated ſtriæ; the longitunal one undulated; about four plaits in the pillar.

polygona. 74. V. tapering, punctured, whirls longitudinally ribbed, and finely ſtriated tranſverſely; three firſt angular; about five plaits in a ſlightly umbilicated pillar.

acuminata. 75. V. tapering, cancellated; beak ſhort and cancellated; four plaits in the pillar. Tranquebar.

biplicata. 76. V. tapering, ſmooth, white with yellow ſpots and black dots; pillar doubly plaited.

turricula. 77. V. tapering, two plaits in the pillar: whirls turgid, with a band of black dots; firſt whirl double.

lineata. 78. V. tapering, with perpendicular black lines croſſing a white band; 3 plaits in the pillar.

diſcors. 79. V. tapering; beneath brown dotted with white; above white, with perpendicular waved yellow ſtripes; a minute ſhell.

ſtriata. 80. V. tapering, finely ſtriated tranſverſely; duſky, with red dots, and two paler bands; minute.

ſulcata. 81. V. tapering and grooved longitudinally; brown, with a tranſverſe white nodulous band; pillar five-toothed.

lævigata. 82. V. tapering, ſmooth, brown; ſpire with a paler band; narrow, ſmall.

ocellata. 83. V. tapering, cheſnut, with white eyes; minute.

naſuta. 84. V. tapering, red, with rows of black dots; lip prominent; beak reflected.

marmorea. 85. V. tapering, varied with white and brown; lip inflected.

barbadenſis. 86. V. tapering, reddiſh, finely ſtriated tranſverſely; aperture oblong, oval; ſpire obtuſe; 1½ inch long. American ſeas.

clathrata. 87. V. tapering, cancellated, with an obtuſe ſpire: lip margined; beak reflected. American ocean.

tricolor. 88. V. tapering, gibbous, yellow; each whirl with a white band, teſſelated with black; 3 plaits in the pillar.

turrita. 89. V. tapering, cheſnut brown, with undulated brown lines; aperture ſtriated; 3 plaits in the pillar.

ſyracuſana. 90. V. tapering, ſmooth, white, with perpendicular, waved, blackiſh yellow ſtripes. Syracuſe.

nitens. 91. V. tapering, poliſhed, cheſnut; within white; pillar with 4 plaits.

citrina. 92. V. tapering, citron, with rufous bands; 2½ inches long.

mucronata. 93. V. tapering, pale brown, and longitudinally ſtriated; ſpire perforated; pillar perforated, and 4-plaited.

rugoſa. 94. V. tapering, a little ventricoſe; longitudinally wrinkled, and tranſverſely ſtriated; whitiſh with piceous lines.

ſtrigoſa. 95. V. tapering, cinereous, ſtriated with red; ſpire glabrous; whirls rather tumid.

foſſilis. 96. V. tapering, glabrous; 5 plaits in the pillar; has been only found in a foſſil ſtate.

leucoſtecta. 97. V. tapering, thin, glabrous; brown ſurrounded with lines of white dots. Friendly iſlands.

clathrus. 98. V. tapering, whitiſh, cancellated; whirls with a band of yellow ſpots.

virgata. 99. V. tapering, tranſverſely ribbed, with a tranſverſe brown band, and longitudinal waved ſpots; two inches long.

leucoſtoma. 100. V. tapering, cancellated; varied with tawny and white, with waved brown ſpots; mouth ochraceous.

variegata. 101. V. tapering, tranſverſely ſtriated; yellow with a brown band and ſpots.

filaris. 102. V. emarginated, tapering, marked with decuſſated ſtriæ, and red threads; pillar 3-plaited.

volva. 103. V. cylindrical, whitiſh, glabrous; ſpire projecting, obtuſe, emarginated at the baſe; pillar 4-plaited; 2 inches long. Shores of Guinea.

ziervoyelii. 104. V. ovate, bay, longitudinally wrinkled; beneath tranſverſely grooved; ſpire obtuſe, and crenated at the ſuture; 4 plaits in the pillar; lip denticulated.

rhinoceros. 105. V. ovate, triangular, rugged, knotty, tranſverſely grooved and umbilicated; pillar 3-plaited; lip toothed; throat ſtriated; whirls muricated with knobs. Shores of New Guinea.

coſtata. 106. V. tapering, white; ſpire with fine tranſverſe ſtriæ, and rounded ribs; firſt whirl with 3 brown bands; 4 plaits in the pillar.

ſpuria. 107. V. ovate, white; ſpire ſpotted with brown; 6 brown bands in the firſt whirl; tail emarginated; lip impreſſed; pillar 6-plaited.

pertuſa. 108. V. emarginated, ſtriated, and marked with hollow punctures; lip denticulated; 5 plaits in the pillar; 3 inches long. India.

cardinalis. 109. V. emarginated, tranſverſely ſtriated; white with rows of teſſelated cheſnut ſpots; pillar 5-plaited. Indian ocean.

epiſcopalis. 110. V. emarginated, ſmooth; margin of the whirls entire; lip denticulated; 4 plaits in the pillar; 5 inches long. India.—The animal of this ſhell is ſaid to be poiſonous when it is eaten, and has the power of inflicting a wound on thoſe who touch it, with a kind of pointed trunk. The natives of the iſland Tanna employ the ſhell as a hatchet, fixing it in a handle.

papalis. 111. V. emarginated, tranſverſely ſtriated; margins of the whirls and lip denticulated; pillar 4-plaited. Indian ocean.

patriarchalis. 112. V. obovate, ſolid, tranſverſely ſtriated, marked with nodulous plaits; whirls crowned with tubercles. India.

muſica. 113. V. margined with obtuſe ſpines in the whirls; lip ſmooth and very thick; pillar 8-plaited. American ocean. The plaits in the pillar are from 9 to 12 in ſome varieties.

veſpertilio. 114. V. emarginated, with acute ſpines on the whirls; lip ſmooth; pillar 4-plaited; from 3 to 6 inches long. Indian ſeas.

arabica. 115. V. emarginated; whirls tuberculated, and marked with black characters; 5 plaits in the pillar.

hebræa. 116. V. emarginated; whirls with ſubacute ſpines; 5 ſtronger and 3 obſolete plaits in the pillar; 6 inches long. India, Jamaica. Very rare.

turbinellus. 117. V. nearly entire, turbinated, with conic ſomewhat erect ſpines; upper ones larger; pillar 4-plaited; 3 inches long. Indian ocean.

capitellum. 118. V. ovate, rugged, knotty; 3 plaits in the pillar; 2¼ inches long. Indian and American ſeas.

ceramica. 119. V. ovate, acute, with divergent ſpires; about 5 plaits in the pillar; ſpines on the outer whirls gradually leſſening into tubercles. Coromandel and Ceram.

pyrum. 120. V. obovate, ſlightly tailed, with ſtriated whirls on the ſpire; tip produced and quite glabrous; pillar 3-plaited; 7 inches long. Tranquebar and Ceylon.

laponica. 121. V. obovate, ſmooth, with a pointed ſpire, and ventricoſe; pillar 5-plaited. Indian and American ſeas.

vexillum. 122. V. ventricoſe, yellowiſh-white, with orange bands; firſt whirl tuberculated and larger than the reſt; pillar 6-plaited. Indian ocean. Very rare.

flaveſcens. 123. V. pyriform, ſmooth, with yellowiſh clouds; ſpire varied with cheſnut ſpots; 4 plaits in the pillar.

rupeſtris. 124. V. elongated, ribbed; ribs croſſed with fine tranſverſe lines; lip margined; ſpire papillary at the tip; many plaits in the pillar; 4 inches long.

naſſa. 125. V. ventricoſe; ſpire ribbed with fine tranſverſe ſtriæ croſſing the ribs; lip margined, umbilicated; 3 plaits in the pillar; 1 inch long. Mauritius iſland and Guinea.

craticulata 126. V. tapering and tranſverſely ſtriated; white with longitudinal cheſnut ribs; lip denticulated, ſtriated; 3 plaits in the pillar; 3 inches long.

ſpiralis. 127. V. longitudinally ribbed, and finely ſtriated tranſverſely; a row of acute tubercles on the two firſt whirls; 3 plaits on the pillar. Indian ſeas.

magellanica. 128. V. ventricoſe, ochraceous, with white and brown lines; lip ſubulate; whirls of the ſpire convex; firſt largeſt; 2 inches long.

filoſa. 129. V. finely reticulated and ſtriated, with elevated tranſverſe belts; lip crenated; 4 plaits in the pillar, which is a little umbilicated.

fuſcata. 130. V. coarſe, brown, ſmooth; baſe tranſverſely ſtriated; ſpire obtuſe; firſt whirl ventricoſe, with 4 narrow bands; the reſt with a broad white band; pillar with 3 plaits and umbilicated.

E. *Ventricoſe; the ſpire papillary at the tip.*

æthiopica. 131. V. emarginated; ſpire crowned with vaulted ſpines; 4 plaits in the pillar; 7 or 8 inches long. Perſia, Aſia, and the Cape of Good Hope.

cymbium. 132. V. emarginated; whirls of the ſpire with grooved margins; 4 plaits in the pillar; lip callous. Spain, Africa, and America.

olla. 133. V. emarginated; ſpire ſmooth; pillar 3-plaited; 4 inches long. Spain, America, Philippine iſles.

ampla. 134. V. elongated, with a broad aperture; lip acute; whirls of the ſpire ſcarcely viſible; 1 inch long.

neptuni. 135. V. emarginated; covered with a brown cuticle, under which it is reddiſh; lip a little prominent; 4 plaits in the pillar; 4 whirls in the ſpire; 8 inches long; nearly as broad. Perſian gulf.

navicula. 136. V. emarginated; lip a little prominent; pillar 4-plaited; 2 inches long.

papillaris. 137. V. elongated, yellow, with a long tubercle at the tip, which is ſometimes oblique.

indica. 138. V. elongated, yellow, with 3 bands of brown dots; 4 plaits in the pillar. India.

ſcapha. 139. V. coarſe, clouded, with zig-zag brown lines; lip ſubulate, pillar bluiſh with 4 plaits. Cape of Good Hope. Very rare.

cymbiola. 140. V. ovate, glabrous; whitiſh with longitudinal red lines; whirls knotty; 3 plaits in the pillar; 2 inches long. Indian ocean.

præputium. 141. V. ſubovate, teſtaceous, with reddiſh bay ſpots, emarginated at the baſe; 4 plaits in the pillar. Coromandel coaſt.

glans. 142. V. cylindrical, yellowiſh, emarginated; aperture effuſe, ſpreading; 3 plaits in the pillar. Eaſtern ſhores of Africa.

reticulata. 143. V. white, ſmooth, reticulated with gold, emarginated; 4 plaits in the pillar; ſpire conic; firſt whirl cylindrical and ventricoſe; 2 inches long. Java.

ſpectabilis. 144. V. browniſh yellow, ſtriated with brown; 3 plaits in the pillar; 5½ inches long. Straits of Magellan.

Gen. 24. BUCCINUM, *Whelk.*

52 Buccinum.

Gen. Char.—The animal is a limax; the ſhell univalve, ſpiral, gibbous; aperture ovate, terminating in a ſhort canal, leaning to the right, with a retuſe beak or projection; pillar lip expanded.

SPECIES.

A. *Inflated, rounded, thin, ſubdiaphanous, and brittle.*

olearium. 1. B. roundiſh, ſurrounded with obtuſe grooves, between which is an elevated line; aperture without teeth; 4 inches long. Indian ſea.

galea. 2. B. obovate, ſurrounded by grooves which are double on the fore-part; aperture without teeth; pillar umbilicated. Mediterranean and Adriatic ſeas.—This ſhell is nearly as large as a man's head.

perdix. * 3. B, ovate, inflated, ſlightly grooved, and undulated with white; aperture without teeth; 6 inches long. India, America, Weymouth.

pomum. 4. B. ovate, ſurrounded with obtuſe grooves; aperture toothed; 2½ inches long. Java, Amboyna, Mexico.

dolium. 5. B. ovate, ſurrounded with remote obtuſe grooves; beak a little prominent. Sicily, Africa, India.

caudatum. 6. B. ovate, ſurrounded with rounded ribs; beak a little prominent; ¾ inch long.

7. B.

niveum. 7. B. ſnowy, ribbed; outer whirls of the ſpire ſcarcely prominent.

clathratum. 8. B. ovate, longitudinally wrinkled and tranſverſely plaited; with a ſhort recurved beak; pillar lip crenated and grooved within.

lineatum. * 9. B. pyramidal or ſharp-pointed at bottom; white, with dark brown ſpiral lines; very ſmall. Cornwall.

breve. * 10. B. white, with 5 whirls, which are longitudinally ribbed, and tranſverſely ſtriated. Pembrokeſhire coaſt.

minimum. * 11. B. with 5 ſpines, ſpirally ſtriated, and tranſverſely ribbed; leſs than a pea. Norway, England.

obtuſulum. * 12. B. white, opaque, with 3 ſpires; aperture oval. Feverſham creek, England. Minute and rare.

B. *With a ſhort, exſerted, reflected beak; lip outwardly unarmed.*

minutum. * 13. B. white, opaque, with 3 whirls, which are longitudinally ribbed; very minute. Pembrokeſhire coaſt.

læve. * 14. B. ſmooth, with 3 whirls and a long beak; very ſmall. Pembrokeſhire coaſt.

obtuſiſſimum. * 15. B. ſmooth, with 3 whirls, and a long beak; aperture contracted; very minute. Pembrokeſhire coaſt.

echinophorum. 16. B. with 4 tuberculated belts and prominent beak. Adriatic and Mediterranean ſeas.

plicatum. 17. B. a little plaited forwards, marked with decuſſated ſtriæ; aperture toothed; beak recurved. Jamaica.

cornutum. 18. B. *Great ſpiked caſket.* Turbinated, or crowned with ſpines; aperture toothed, beak recurved; from 9 to 12 inches long. India.

rufum. 19. B. *Red helmet.* With decuſſated ſtriæ, and knotty belts, between which is a double line; aperture toothed; beak recurved. America and India.

tuberoſum. 20. B. *Perſian whelk.* With two tuberculated belts, and recurved beak; 10 inches long. American ocean.

flammeum. 21. B. ſlightly plaited and crowned; aperture toothed; beak recurved; 5 inches long. American ocean.

teſticulus. 22. B. obovate, with decuſſated ſtriæ, and elevated longitudinal ones; aperture toothed; beak recurved; 4 inches long. America and India.

decuſſatum 23. B. with decuſſated ſtriæ, and covered with ſmall ſquare ſcales; aperture toothed; beak recurved. Africa, Mediterranean.

areola. 24. B. *Small diced caſket.* Subſtriated and ſurrounded with 4 rows of ſquare ſpots; aperture toothed; beak recurved; 3 inches long; outer pillar lip with a toothed inner margin. India, Mediterranean.

tigrinum. 25. B. ovate, ſmooth, bluiſh, with tranſverſe yellow bands; ſpotted with brown, and intermediate brown characters. New Zealand.

undulatum 26. B. with ſometimes tranſverſe, ſtriated, and waved ſpots; ſpire obtuſe; inner lip glabrous.

cicatricoſum. 27. B. ovate, ſmooth, and covered with hollow punctures; ſpire elongated; lips toothed; beaks recurved. India.

teſſelatum. 28. B. thin, cinereous, with white bands teſſelated with brown; whirls with 5 rows of tubercles; 6 inches long. South ſeas. Very rare.

pennatum. 29. B. white, with variegated yellowiſh, cheſnut, and white bands; beaks recurved. India.

maculoſum 30. B. with 4 ſpotted bands; whirls a little prominent, and longitudinally ribbed; the firſt crowned with tubercles; 3½ inches long.

* 31. B. tranſverſely ſtriated; ſpire obtuſe; whirls with a ſpotted band and 2 lines. Weymouth. *bilineatum.*

32. B. coarſe, tranſverſely ſtriated and wave ſpotted; ſpire acute, pyramidal; 2 inches long. *gibbum.*

33. B. ventricoſe, ſtriated, pillar lip thin; beak ſhort. *ventricoſum.*

34. B. tranſverſely ſtriated; ſpire acute; the 2 firſt whirls crowned with ſpines; outer pillar lip ſpotted within, and emarginated without. *ſtrigoſum.*

35. B. ſmooth, with undulated ſpots; ſpire rugged and ſtriated; beak with 5 plaits; outer pillar lip ſtrong and ſtraight. *rugoſum.*

36. B. coarſe, and with a ſlightly prominent, acute ſpire; firſt whirl crowned with tubercles; outer pillar ribbed within. *ponderoſum.*

37. B. ſmooth, and marked with a band of rufous ſpots; ſpire a little prominent; firſt whirl inflected; 2½ inches long. Barbadoes. *recurviroſtrum.*

38. B. tranſverſely ſtriated, and ſpotted here and there, with three equal bands; aperture bluiſh within; outer pillar lip toothed; inner with rows of tubercles; 3 inches long. *trifaſciatum.*

39. B. finely ſtriated tranſverſely, and with three ſpotted bands; ſecond whirl of the ſpire ſurrounded with a turgid ring; outer pillar lip crenated. Senegal. *ſenegalicum.*

40. B. ochraceous, tranſverſely ſtriated; firſt whirl crowned with ſpines; outer pillar lip toothed; inner repand; 2½ inches long. *ochroleucum.*

41. B. tranſverſely ſtriated; ſpire depreſſed; outer whirl knotty at the margin; aperture toothed; beak recurved. America. *ſtriatum.*

42. B. obovate, umbilicated, fulvous, with numerous tranſverſe ſtriæ; pillar lip membranaceous; united lip of the aperture acute. Mediterranean. *caſſis.*

43. B. ovate, tranſverſely grooved, whitiſh with reddiſh bands, varicoſe; ſpire conic, with decuſſated ſtriæ; aperture oblong, toothed; inner pillar lip plaited, granulated; lip of the aperture fringed, ſpotted. India. *ſtrigatum.*

44. B. globular, yellowiſh, grooved and ſtriated; ſpire conic; aperture white; lip margined, and ſlightly toothed within. Seas round Tuſcany. *tyrrhenum.*

45. B. ovate, white, tranſverſely ſtriated, and grooved; ſpire conic; lip of the aperture doubled, and toothed within; pillar lip reflected and wrinkled; beak very ſhort. India and America. *abbreviatum.*

C. *Lip prickly outwardly behind.*

46. B. *Small curled caſket.* A little plaited, and crowned with papillæ. America, India. *erinaceus.*

47. B. *Smooth gray caſket.* Smooth, crowned with papillæ; 5 inches long. Indian ſea. *glaucum.*

48. B. *Smooth ſpotted-lipped caſket.* Entirely ſmooth, with yellowiſh, waved, brown ſpots. America, India. *vibex.*

49. B. ventricoſe; whirls of the ſpire with a band at the baſe, teſſelated with black. *teſſelatum.*

50. B. ſlightly plaited and crowned with papillæ; lip ſmooth, with two rows of ſharp ſpines behind; 1 inch long. *noduloſum.*

51. B. grooved, with an acute ſpire; whirls with rows of tubercles. *fimbria.*

papilloſum. 52. B. *Small bugle netted whelk.* Covered with tubercles, in rows; 2¼ inches long. Indian ſea. Rare.

glans. 53. B. ſmooth, inner pillar lip with two teeth; 2 inches long. Indian ocean. Very rare.

D. *Pillar lip dilated and thickened.*

arcularia. 54. B. plaited and crowned with papillæ. Indian ocean.

pullus. 55. B. *Small coffer ſhell.* Gibbous, obliquely ſtriated and tuberculated; aperture wrinkled; not an inch long. Mediterranean and European coaſts, Britain.

gibboſulum 56. B. gibbous, ſmooth, ſnowy, tinged or ſpotted; ſmall. Mediterranean and Indian ſeas.

mutabile. 57. B. ſmooth, rugged; ſpire exſerted; inner lip extended forward, and thickiſh. Mediterranean.

neriteum. 58. B. convex, obtuſe, ſmooth; inner pillar lip obſolete; ſize of a pea. Mediterranean.

E. *Pillar lip appearing as if worn flat.*

harpa. 59. B. *Muſical-harp ſhell.* With equal, longitudinal, diſtinct mucronate veins; pillar lip ſmooth; from 3 to 5 inches long. Indian ſea.

coſtatum. 60. B. with equal, longitudinal, crowned mucronate veins; pillar lip ſmooth. Falkland iſlands. Very rare.

perſicum. 61. B. flat, with the lip crenulated, and the pillar flat; 4 inches long. India, and Perſian gulf.

monodon. 62. B. rough with a crenulated lip; pillar flat, protruding obliquely a ſubulate ſpine; gray, white within. America.

patulum. 63. B. muricated; the lip crenated without; the pillar falcated; 4 inches long. America and Ethiopia.

hamaſtoma. 64. B. ſlightly muricated; lip ſtriated within; the pillar rather flat; throat fulvous; 2 inches long. Mediterranean and Ethiopic ſeas.

lapillus. * 65. B. *Purple whelk.* Ovate, acute, ſpirally ſtriated, without protuberances; pillar flattiſh; 1½ inches long. The colour is white, cinereous, or yellowiſh; the ſhell is often tranſverſely bored or grooved; it is ſometimes thin and without teeth in the aperture, and ſometimes more ſolid, and the aperture toothed. Shores of Europe, Britain.—This is one of the ſpecies which yields a fine purple dye.

ſmaragdulus. 66. B. ovate, acute and glabrous; pillar flattiſh and ſlightly plaited; grooved; ſhines with a green gloſs, and like mother-of-pearl.

tuba. 67. B. fuſiform, yellowiſh brown; the ſpire cancellated; firſt whirl ſmooth, and three times longer than the reſt; ventricoſe above. India.

pyrum. 68. B. turbinated; aperture red; pillar ſmooth; the ſpire ſhort; firſt whirl ventricoſe. India, Red ſea. Very rare.

ſpadiceum. 69. B. oblong, turbinated; cheſnut, with tranſverſe undulated white lines.

foſſile. 70. B. convex, tranſverſely plaited; ſpire ſhort; pillar callous. Found foſſil in Germany.

umbilicatum. 71. B. oblong, turbinated and plaited; ſpire knotty; aperture grooved within; pillar ſlightly umbilicated.

candidum. 72. B. oblong, turbinated; ſolid, ſmooth and white.

ſcala. 73. B. oblong; aperture oval, emarginated, four-toothed; baſe white; ſpire acute; the whirls diſtant; the firſt with four glabrous ribs.

craſſum. 74. B. ventricoſe, coarſe, gray, glabrous; aperture oval; pillar callous; baſe with two calloſities; ſpire ſcarcely prominent: has 5 whirls.

marginatum. 75. B. ſubglobular, glabrous; aperture oval, margined on each ſide; lip toothed; pillar a little ſtriated; ſpire ſcarcely prominent. Found in a foſſil ſtate.

labyrinthus. 76. B. ponderous, convex, glabrous; whirls diſtant and margined; aperture oval, ample; pillar obliquely plaited. Holland.

ruſticum. 77. B. coarſe, ovate, oblong, white with tranſverſe brown ſtriæ; aperture oval; beak prominent; firſt whirl ventricoſe. India, Africa.

varium. 78. B. ovate, coarſe, yellow, with elevated knotty, tranſverſe darker ribs; aperture oval, without teeth.

filoſum. 79. B. ovate, whitiſh, ſurrounded with red threads; ſpire a little prominent; aperture oval; lip ſtriated with red; pillar ſlightly umbilicated.

coronatum. 80. B. ovate, ſtriated, whitiſh with cheſnut ſhades; a white band in the middle, edged with brown ſpots on each ſide; gibbous in the middle.

ſqualidum. 81. B. ſubglobular; whitiſh with leek-green and lurid teſſelated ſpots in rows; 4 whirls in the ſpire.

craſſum. 82. B. ſubcylindrical, tranſverſely ſtriated, reddiſh with cheſnut bands; lip denticulated. Ceylon.

fornicatum. 83. B. ſtriated; brown, ſpotted and barred with white; whirls channelled with 4 rows of knots; 1¼ inch long.

F. *Smooth, and not included in the former diviſions.*

ſpiratum. 84. B. *Diced whelk.* Smooth; whirls 6 or 7 in the ſpire, ſeparated by a canal; pillar abrupt and perforated; 2 inches long. India and China.

pyrozonias 85. B. with tranſverſe plaits and undulated ſtriæ; the baſe and ſpine a little prominent; each of the whirls with a fulvous band; the firſt double.

læviuſculum. 86. B. oblong, finely ſtriated, pale brown with darker bands; aperture oval, terminating in a canal; firſt whirl gibbous and large; whirls 5 or 6. India.

ocellatum. 87. B. ſmooth, black, with rows of white ſpots and dots; ſpire prominent; firſt whirl ventricoſe.

pyramidale. 88. B. obtuſely pyramidal and tranſverſely ſtriated; white, with blackiſh and brown clouds and ſtripes. Tranquebar.

glaberrimum. 89. B. quite glabrous and minute; ſometimes with a teſſellated band on the two firſt whirls.

ſtrigoſum. 90. B. minute, tranſverſely ſtriated; toothed or ſpotted in the aperture.

trifaſciatum. 91. B. glabrous with 3 broad red bands within; firſt whirl of the ſpire ventricoſe; 1 inch long.

leucozonias. 92. B. glabrous, and marked with a white band and cheſnut lines. Minute.

cancellatum 93. B. glabrous, with decuſſating bands and lines.

obtuſum. 94. B. glabrous, ochraceous; ſpire with an obtuſe blue tip; firſt whirl ventricoſe; two inches long.

glabratum 95. B. glabrous, with obtuſe whirls; the loweſt ſlightly channelled and produced at the baſe; 4 inches long. America, Africa.

ſtromboides. 96. B. glabrous; 5 or 6 whirls diſtinct; lip prominent; baſe obliquely ſtriated.

præroſum 97. B. ovate, ſmooth, black with a carious ſpire; pillar glabrous; ſize of a bean; crown jagged, abrupt. Southern Europe.

auſtrale. 98. B. oblong, ſmooth, thin, banded; aperture oval, entire; 3 inches long. Rivers of New Zealand.

orbita. 99. B. ovate, thick, whitiſh, tranſverſely ribbed and grooved; aperture oval; lip plaited within; pillar lip flat. Shores of New Zealand.

turgidum. 100. B. obovate, ſlightly umbilicated; yellowiſh, with rows of red ſpots; lips ſinuated. New Zealand.

G. *Angular, and not enumerated in the former diviſions.*

undoſum. 101. B. ovate, with tranſverſe, elevated, glabrous ſtriæ; belly obtuſely 5-angular; lip ſtriated within; 2 inches long. Malacca.

affine. 102. B. ovate, with tranſverſe, elevated, glabrous ſtriæ; belly cylindrical; lip ſtriated within.

tranquebaricum. 103. B. ovate; ſpire with 12 angles and tranſverſely ſtriated; aperture toothed; lip orange; pillar perforated. Coromandel coaſt.

verſicolor. 104. B. coarſe, dirty brown, tranſverſely ſtriated; 2 rows of black dots in the interſtices of the ſtriæ; 4 channelled whirls in the ſpire. India.

cruentatum. 105. B. tranſverſely ſtriated with red parallelogram ſpots.

ſulcatum. 106. B. ovate; brown with ſnowy ſpots; whirls of the ſpire grooved; lip crenulated; throat ſtriated.

rumpſii. 107. B. thin, narrow, ventricoſe; ſpire conic, depreſſed; firſt and ſecond whirls crowned with ſpines.

bezoar. 108. B. roundiſh, wrinkled; whirls lamellated on the fore-part; pillar perforated. China.

glaciale. 109. B. ovate-oblong, ſmooth, a little ſtriated; lower whirl ſlightly keeled; 2 inches long. Northern ſeas.

undatum. * 110. B. *Waved whelk.* Oblong, coarſe, with deep, tranſverſe, undulated ſtriæ; whirls 7, with many curved angles; 3 to 4 inches long. India, Europe; very common on the ſhores of Britain.—The fiſhermen, from ſuppoſing that it is deſtructive to the large ſcallop (*oſtrea maxima*), by inſinuating its tail, as they term it, into the ſhell, either uſe it for bait, or deſtroy it, when they take it in dredging. The ſpawn of this ſpecies is often found in cluſters in many parts of the coaſt.

ſtriatum. * 111. B. ovate-oblong, with tranſverſe elevated ſtriæ, which are undulated near the tip; 4 inches long. Coaſts of Britain.

ciliatum. 112. B. elongated, ſlightly tailed; angular; longitudinally ciliated; pillar ſlightly plaited; whirls 5; 6 inches long. Greenland ſeas.

viridulum. 113. B. oblong, pointed, glabrous; minutely ſtriated tranſverſely, and longitudinally ribbed; 4 lines long. Greenland ſeas.

carinatum. 114. B. oblong, conic, and tranſverſely ſtriated; upper whirls with many oblique and obtuſe angles, lower ones with a ſingle ridge. South ſea.

ſolutum. 115. B. ovate with unequally diſtant longitudinal tubercles on the belly; lip channelled and a little diſtinct; ribs 6; firſt and ſecond whirls broadeſt; ſpire obtuſe. Shell whitiſh mixed with yellow.

tænia. 116. B. oblong, glabrous, brown, with a yellowiſh band in the middle of the firſt whirl.

lineatum. 117. B. cinereous, with longitudinal, undulated, and interrupted tranſverſe brown ſtriæ; margin white, ſpotted with brown; aperture white.

maclovienſe. 118. B. oblong, with waved ſpots and clouds; ſpire ſhort; firſt whirl gibbous; tail narrow, prominent.

foliorum. 119. B. thin, with a ſhort, acute, ſlightly ribbed ſpire; the firſt whirl a little globular; 1 inch long. India, among the leaves and branches of maritime ſhrubs.

textum. 120. B. ventricoſe, cancellated; whirls diſtant; 1 inch long.

ſtrigoſum. 121. B. oblong; longitudinally plaited, and tranſverſely ſtriated; the ſtriæ brown and black, and ſtriated with white, ventricoſe; aperture ribbed; pillar ſlightly plaited; 2 inches long.

anglicum. * 122. B. oblong with tranſverſe elevated ſtriæ; 6 brown whirls in the ſpire; a little ventricoſe. Britain.

porcatum. * 123. B. ventricoſe, ribbed, brown; the firſt whirl covering the next. Britain.

læviſſimum. 124. B. glabrous, white; ſpire bluiſh at the tip, obtuſe; firſt whirl largeſt, ventricoſe.

igneum. 125. B. oblong, narrow, glabrous; yellowiſh, with red waved ſpots and clouds; outer whirls perpendicularly ſtriated.

plumatum. 126. B. oblong, narrow, cheſnut with darker belts; throat narrow, black or blue, with ſtriated teeth; lip ſtriated within; ſpire acute. South American iſlands.

lyratum. 127. B. oblong, narrow, horizontally ribbed; ribs tranſverſely ſtriated; pillar ſmooth.

clathratum. 128. B. ovate, ventricoſe, hoary; longitudinally ribbed, and tranſverſely plaited; lip grooved within; ſpire acute; beak ſhort, recurved.

reticulatum. * 129. B. *Reticulated whelk.* Oblong, ovate, tranſverſely ſtriated, and longitudinally wrinkled; aperture toothed, gloſſy; ſize of a nut. European and Ethiopic ſeas, Britain.

minutum. * 130. B. with 5 whirls, ſpirally ſtriated and tranſverſely ribbed; leſs than a pea. Norway, Britain.

niveum. 131. B. ovate, cancellated, white; 5 whirls, firſt ventricoſe; 1 inch long. Tranquebar.

ſcalare. 132. B. yellow, with pale brown bands; ſpire with 6 whirls cancellated; whirls flat, diſtant, the firſt a little convex; aperture triangular; lip toothed; pillar plaited, verrucoſe, umbilicated. A very rare ſhell.

indicum. 133. B. with decuſſated ſtriæ, brown, within white. India.

noduloſum. 134. B. white, varied with brown; tranſverſely ſtriated; here and there knotty. Shores of American iſlands.

piſcatorium. 135. B. cancellated and nodulous in the angles of the ſection; aperture toothed on each ſide, and acute. India.

mauritii. 136. B. white, within yellowiſh; lip 6-toothed; whirls crowned with ſpines, the firſt with 4 rows. Mauritius.

armillatum. 137. B. oblong; aperture ſimple, and without teeth; each whirl crowned with a row of tubercles.

plicatulum. 138. B. oblong; perpendicularly plaited, and tranſverſely ſtriated; with alternate white and brown bands; violet within. India.

vulgatum. * 139. B. ventricoſe, oblong; with longitudinal plait-like ſtriæ, croſſed with fine undulated tranſverſe ones. Mediterranean, Shores of England.

ſtolatum. 140. B. with party-coloured bands, tranſverſely ſtriated; ſpire horizontally ribbed, part of the firſt whirl glabrous. Tranquebar.

nanum. 141. B. white, cancellated; ſpire acute; minute.

exile. 142. B. narrow, cancellated; aperture large, crenated and ſpotted; ſmall.

chalys. 143. B. cancellated; with perpendicular ribs; the interſtices ſmooth and flat; aperture ovate; ſpire hardly prominent; a minute ſhell.

verrucoſum. 144. B. ſtriæ decuſſated, knotted in the angles of ſections; ventricoſe; pale yellow, with a bluiſh band on each whirl; 1½ inches long.

alatum. 145. B. gibbous, with decuſſated ſtriæ, knotty in the angles of ſection, the tranſverſe ſtriæ undulated; lip winged; 1 inch long.

nigropunctatum. 146. B. narrow, rugged; wrinkles tuberculated with white, and dotted with black; ¾ inch long.

nitidulum. 147. B. ovate, oblong, poliſhed; barred and marked with longitudinal rugged ſtriæ; lip ſlightly toothed within. Mediterranean.

Lævigatum. 148. B. ovate, oblong, poliſhed, ſtriated with brown, and ſmooth; aperture without teeth or pillar lip; ſpire without plaits. Mediterranean.

lamelloſum 149. B. ſlightly plaited, tranſverſely ribbed, grooved, tuberculated, lamellous; barred with cheſunt, brown, and white. New Zealand.

ſcutulatum. 150. B. ſmooth, cheſnut-brown, veined, with flattiſh whirls, and obtuſe beak. New Zealand.

hauſtorium 151. B. ovate, ventricoſe, black, with a ſhort ſpire; pillar depreſſed, white; throat white; lip ſtriated and crenulated within. New Zealand.

ventricoſum. 152. B. ovate, oblong; brown ſtriated with white, and ſlightly plaited.

teſtudineum. 153. B. ovate, ſmooth, with alternate whitiſh and browniſh ſpots in interrupted rows. Shores of New Zealand.

catarrhacta. 154. B. ovate, rough, with crowded tranſverſe grooves and flame-coloured undulations. New Zealand.

tahitenſe. 155. B. tapering; tranſverſely ribbed and grooved; with a nodulous ſpiral ſtria at the ſuture of the whirls; aperture ovate; lip ſlightly plaited. Otaheite.

lamellatum. 156. B. imperforated, lamellated; white, within purple; lip white; 1½ inches long.

H. *Tapering, ſubulate, ſmooth.*

maculatum 157. B. ſomewhat ſpindle-ſhaped, with ſmooth, undivided, entire whirls; ſpire with 14 or more whirls. Aſia, Africa.

ſubulatum. 158. B. ſubulate, ſmooth, undivided, very entire; firſt whirl not gibbous; 5 inches long. Indian ocean.

crenulatum. 159. B. whirls of the ſpire bifid, with a crenated margin; 5 inches long. Africa and India.

hecticum. 160. B. whirls of the ſpire bifid; upper margin compreſſed, tapering; 4 inches long. Africa.

vittatum. 161. B. ſubſtriated, with a double crenated ſuture on each of the whirls; 2 inches long. Africa and India.

ſtrigilatum 162. B. whirls of the ſpire 16 or 20, bifid and obliquely ſtriated; 2¼ inches long. Southern ſeas of Africa.

duplicatum 163. B. whirls of the ſpire biparted and ſtriated; 4 inches long. India.

lanceatum. 164. B. ſmooth with entire whirls, and longitudinal teſtaceous lines; thin; ſpire acute. India.

dimidiatum. 165. B. whirls of the ſpire bifid, ſmooth; 4 inches long. Africa and India.

murinum. 166. B. whirls of the ſpire ſubangular, with 3 muricated ſtriæ; black; baſe gibbous; whirls white at the baſe. Africa.

tigrinum. 167. B. pellucid, white with reddiſh dots; the whirls ſlightly emarginated, on the back; a very minute ſhell.

168. B. acute, whitiſh, with undulated horizontal lines; whirls bifid, crenulated, and wrinkled; pillar ſpirally twiſted; 1½ inch long. *acus.*

169. B. ſubulate, horizontally ſtriated; whirls girt; white or ſtraw colour. Indian ocean. *ſuccinctus.*

170. B. ſubulate, varied with yellow or reddiſh patches; whirls flattiſh, tranſverſely ſtriated, and ſurrounded with an elevated belt. *commaculatum.*

171. B. ventricoſe; whirls perpendicularly ſtriated with alternate brown and white bands; 1½ inches long. *haſtatum.*

172. B. white, with brown bands of hollow dots. *aciculatum.*

173. B. whirls of the ſpire longitudinally ribbed, the baſe with a rugged ſuture; lip a little prominent and emarginated above; 9 whirls in the ſpire; ribs a little curved. India. *phallus.*

174. B. whirls of the ſpire convex, diſtant, tranſverſely ſtriated; upper ones horizontally ribbed; 3½ inches long. Found in freſh waters. *flumineum.*

175. B. whirls of the ſpire ribbed, and tranſverſely ſtriated, the firſt gibbous; beak a little prominent 1½ inch long. *aſperum.*

176. B. reticulate, wrinkled, with an incurved ſpire; aperture crenated; pillar wrinkled; lip thickened. *muricinum.*

177. B. the whirls ſurrounded with a row of tubercles; minute. *tuberculatum.*

178. B. ſubulate, punctured, tranſverſely ſtriated; aperture obovate; whirls of the ſpire ſurrounded with a band, the firſt ventricoſe; 1 inch long. *punctulatum.*

179. B. ſubulate, ſmooth, thin, and finely ſtriated tranſverſely; whirls of the ſpire contiguous; tapering to a point. In freſh waters. *acicula.*

180. B. aperture ovate, oblong; whirls ventricoſe, diſtant and horizontally ſtriated; the ſtriæ elevated and ſeparated by an intermediate band. *faſciolatum.*

181. B. ſubulate, ſmooth, ſnowy, with 2 bands; whirls of the ſpire contiguous. *niveum.*

182. B. a little ventricoſe; white, with brown undulations; aperture oval; whirls 5; 3 inches long. *mucronatum.*

183. B. coarſe, with a ſubincurved obtuſe lip; ½ inch long. India. *digitellus.*

184. B. whirls of the ſpire entire, with oblique decuſſated ſtriæ; a finger's length, thickneſs of a quill. India. *obliquum.*

185. B. ſubangular, grooved; ſteel-blue or dotted with white and black; 1¼ inch long. India. *chalybeum.*

186. B. thin, with contiguous whirls; beak ſlightly emarginated; 4 to 5 inches long. India, in the mouths of muddy rivers. *fluviatile.*

187. B. ſubulate; whitiſh with reddiſh rays; whirls convex, ſurrounded with granulated ſtriæ; firſt largeſt and ventricoſe. *radiatum.*

188. B. whirls of the ſpire longitudinally wrinkled, and marked with tranſverſe granulated ſtriæ, the firſt twice as large as the next; 1 inch long. *lividulum.*

189. B. whirls ſpotted; aperture long, without teeth; pillar plaited. *edentulum.*

190. B. longitudinally ſtriated, with punctured ſpotted bands between the whirls. *pugio.*

191. B. ſpotted with 17 grooved whirls. *canaliculatum.*

192. B. whirls of the ſpire convex, and twice *varicoſum.*

crowned; the firſt with 3 rows of punctures; 3½ inches long.

cuſpidatum 193. B. ſubulate, ſpotted; whirls convex, ſubremote.

cinereum. 194. B. ſubulate, ſmooth, cinereous, with obſolete bands; whirls undivided and longitudinally ſtriated at the future; whirls 14; 2 inches long.

virgineum. 195. B. greeniſh yellow, with 2 red bands; whirls of the ſpire flattiſh; aperture large, oval. Rivers of Virginia.

proximatum. 196. B. whirls of the ſpire bifid; lower one ſubſtriated, upper one filiform; ſubulate, gloſſy.

monile. 197. B. whirls of the ſpire bifid; upper one grooved; lower one moniliform, ſubulate; yellowiſh white.

cingulatum 198. B. with 3 elevated belts grooved above and beneath; ſize of a cherry. Iceland.

geminum. 199. B. whirls of the ſpire bifid; the lower one ſubſtriated, upper one more protuberant; white; ſubulate.

obtuſulum. * 200. B. white, gloſſy, ſemipellucid; 5 whirls in the ſpire; aperture oval. Faverſham, England.

Gen. 25. STROMBUS.

53 Strombus. *Gen. Char.*—The animal a limax: the ſhell univalve, ſpiral; aperture much dilated; the lip expanding, and produced into a groove leaning to the left (c).

SPECIES.

A. *The lip projecting into linear diviſions or claws.*

fuſus. 1. S. tapering, ſmooth, with a ſubulate beak and toothed lip. Red ſea.

pes-pelicani. * 2. S. *Corvorant's Foot*; lip with four palmated angular claws; mouth ſmooth; whirls tuberculated; 2 inches long. European and American ſeas, ſhores of Britain.

chiragra. 3. S. lip with 6 curved claws, and recurved beak; lip ſtriated; two hind claws divergent and bent outwards; beak tuberculated. Indian ocean. Rare ſhell.

ſcorpius. 4. S. lip with 4 knotty claws; hinder one very long; 4 inches long.

lambis. 5. S. lip with ſeven ſtraightiſh claws; mouth ſmooth. Aſia. A large ſhell.

millepeda. 6. S. lip with 10 inflected claws; mouth ſubſtriated; back compreſſed; gibbous. Aſia. Rare.

clavus. 7. S. tapering, ſmooth, with a ſubulate beak, and ſimple lip.

B. *Lobed.*

lentiginoſus. 8. S. lip thickened and 3-lobed on the fore-part; back warty, and crowned with tubercles; beak obtuſe; 3½ inches long. Aſia, America.

faſciatus. 9. S. lip entire; back crowned with 3 rows of protuberances, and roſy between them. Africa.

raninus. 10. S. lip thin, rugged, repand above; back orange, tranſverſely ſtriated, and crowned with tubercles; aperture white, poliſhed.

gallus. 11. S. lip mucronate on the fore-part, and very long; back crowned with tubercles; beak ſtraight; 6 inches long. Aſia and America.

12. S. lip projecting into a ſharp point; back muricated; beak erect and acute; 3 inches long. Aſia. *auris-dianæ.*

13. S. anterior lip prominent, rounded, ſmooth; ſpire ſpinous; beak 3-lobed, obtuſe. South America. *pugilis.*

14. S. anterior lip rounded, prominent, ſmooth; ſpire unarmed; beak 3-lobed, obtuſe. *alatus.*

15. S. lip a little prominent; beak entire; back margined, ſmooth. *marginatus.*

16. S. lip a little prominent; back ſmooth; whirls rounded, equal; 2½ inches long. Aſia. *luhuanus.*

17. S. lip a little prominent; beak ſmooth; whirls gibbous, unequal. Aſia. *gibberulus.*

18. S. obovate, with knotty belts, and a ſubulate, ſmooth projection; an inch long. South America. *oniſcus.*

C. *Dilated.*

19. S. lip rounded, entire on the fore-part; belly doubly ſtriated; ſpire crowned with tubercles; upper ones minute. South America. *lucifer.*

20. S. lip rounded, and very large; ſhell crowned; belly and ſpire with conic expanded ſpines; gloſſy white; within, a rich roſe colour; 10 inches long. South America. *gigas.*

21. S. lip rounded, very large; belly unarmed; ſpire a little knotty; 14 inches long. Aſia. *latiſſimus.*

22. S. lip rounded, ſhort; belly ſmooth; ſpire a little knotty; 3½ inches long. Southern Aſia. *epidromis.*

23. S. lip retuſe, gibbous; belly and ſpire with knotty plaits; aperture 2-lipped, ſmooth; 1½ inch long. India. *minimus.*

24. S. ſomewhat heart-ſhaped; with a round, ſhort, retuſe, ſmooth lip; pillar ſmooth; 2½ inches long. Aſia. *canarium.*

25. S. lip rounded, ſhort; belly ſmooth; ſpire elongated; whirls divided by an elevated future; 4 inches long. *vittatus.*

26. S. lip rounded, retuſe; belly ſmooth, with 4 pale, linear, punctured belts. Aſia. *ſuccinctus.*

27. S. lip tapering, entire, ſlightly plaited, and crowned with fine ſpines; ſpire prickly. Hitherto found in a foſſil ſtate only. *ſpinoſus.*

28. S. lip continued into a longitudinal cleft ridge. India. Frequently found foſſil in Campania. *fiſſurella.*

29. S. lip tapering, retuſe, ſhort, ſtriated; belly and ſpire with knotty plaits; aperture 2-lipped, unarmed; 2½ inches long. Indian oceans. *urceus.*

30. S. thin, white, with orange ſpots and clouds; back ſmooth, plaited; whirls grooved; lip 3-toothed; beak violet. Indian ocean. *tridentatus.*

31. S. lip tapering, ſhort-toothed; belly and ſpire plaited; 1½ inch long. *dentatus.*

32. S. very thick; firſt whirl crowned with tubercles; interſtices of the tubercles plaited; the next whirl tranſverſely ribbed; the reſt tranſverſely ſtriated; 6 inches long. *coſtatus.*

33. S.

(c) It ought to be obſerved, that theſe ſhells, in their young ſtate, want the lip, and then have a thin turbinated appearance; from which circumſtance they have been ſometimes referred to a different genus.

bryonia. 33. S. conic, with a mucronate, 8-toothed lip; ſpire knotty; 7 inches long; very rare.

affinis. 34. S. tranſverſely ſtriated, gibbous; ſpire unarmed; firſt whirl crowned with tubercles.

lotus. 35. S. lip a little prominent, and twice emarginated beneath; firſt whirl of the ſpire ſmooth in the middle, and tranſverſely ſtriated on each ſide; the reſt crowned with obtuſe knots.

levis. 36. S. ſmooth, ſilvery, radiated with brown; with obſolete tranſverſe plaits; ſpire elongated, with inflated, rounded whirls; above 2 inches long.

vexillum. 37. S. ſolid, ſubcylindrical, with alternate, reddiſh and ochraceous bands; lip denticulated within; pillar flat, glabrous, and emarginated at the baſe. Indian ocean; very rare.

norwegicus. 38. S. oblong, ſubulate, white, with round whirls; aperture ſpreading; ovate; beak a little aſcending.

D. *Tapering, with a very long ſpire.*

tuberculatus. 39. S. oblong, ovate, tuberculated; lip thickened.

paluſtris. 40. S. ſmoothiſh; lip ſeparated behind. Savannahs of the Indian ocean.

ater. 41. S. ſmooth; lip ſeparated before and behind; 26 lines long. Fens of Amboyna.

lineatus. 42. S. ſubulate, brown, with 7 ſpiral impreſſed lines; aperture ovate; 11 lines long.

punctatus. 43. S. ſhell ſubulate, yellowiſh, with a white band; ſtriated with red near the ſuture; leſſer whirls grooved, 6 larger ones ſmooth; ſpire with 12 or 13.

vibex. 44. S. ſubulate, cinereous, tranſverſely ſtriated; whirls 8 to 11, knotty, and marked with red ſtreaks. Coromandel, Friendly iſlands.

auritus. 45. S. barred with brown; whirls 7, muricated; each with 7 yellow compreſſed tubercles; aperture ovate; 10 lines long. Africa.

aculeatus. 46. S. brown, tuberculated; whirls 12, with 5 rows of tubercles on each; minute; lip depreſſed, crenulated; 18 lines long. Marſhes of Africa.

agnatus. 47. S. ſmooth; lip very prominent, and emarginated behind.

dealbatus. 48. S. with black whirls tranſverſely ſtriated; outer ones ſmooth; margin of the lip and pillar white.

fuſcus. 49. S. brown, with numerous tubercles and whirls; lip ſeparated before and behind; within ſtriated with brown.

marginatus. 50. S. brown; loweſt whirl edged with white.

lividus. 51. S. ſubangular, with ſpinous knots; lip ſeparated on the fore-part; brown, tranſverſely ſtriated.

ſtriatus. 52. S. convex, ſtriated, white, with a few fulvous ſtreaks; pillar ſinuated, inflected, thin, pellucid; 2½ inches long.

ſiniſter. 53. S. whirls reverſed, thin, longitudinally ſtriated; 1¼ inch long, with 10 whirls. Hitherto found in a foſſil ſtate only in Helvetia.

Gen. 26. MUREX.

54
Murex.

Gen. Char.—The animal a limax; the ſhell univalve, ſpiral, rough, with membranaceous ſutures; aperture oval, terminating in an entire, ſtraight, or ſlightly aſcending canal.

SPECIES.

A. *Spinous, with a produced beak.*

hauſtellum. 1. M. ovate, tuberculated; with a long ſubulated, ſtraight, muricated beak. Aſia, America, Red ſea.

tribulus. 2. M. *Thorny woodcock.* Ovate, with a triple row of ſetaceous ſpines; beak elongated, ſubulate, with ſimilar ſpines. Var. 1. With ſpines ſhorter than the beak. 2. With ſpines as long as the beak. This laſt is rare. Aſia, America, Red ſea.

cornutus. 3. M. roundiſh, ſurrounded with ſubulate, oblique ſpines; beak long, ſubulate, ſtraight, with a few ſhort ſpines; 8 inches long; ſpines 2 inches. Africa. Very rare.

brandaris. 4. M. ſubovate, ſurrounded with ſtraight ſpines; beak ſubulate, ſtraight, obliquely ſurrounded with ſpines. Mediterranean, Adriatic.

trunculus. 5. M. ovate, knotty, and ſurrounded with ſpines on the fore part; beak ſhort, perforated, truncated. Mediterranean, Jamaica.

pomum. 6. M. ovate, knotty, with 3 to 7 protuberances; beak broad; coarſe and ponderous. Eaſtern ſhores of Africa.

decuſſatus. 7. M. ovate, tranſverſely grooved, with tranſverſe ribs croſſed by perpendicular knots; beak imperforated; 7 diſtinct whirls in the ſpire. Africa.

triacanthus. 8. M. turgid, knotty, tranſverſely ſtriated, with a triple row of ſpines. Found in a foſſil ſtate.

melanamathos. 9. M. tranſverſely ſtriated, with 8 rows of hollow black ſpines; ſpire a little knotty and prickly; beak ſubulate.

radix. 10. M. white, with numerous rows of leafy, black, undulated ſpines. A very rare ſhell.

candidus. 11. M. white, with rows of ſpines, and very ſhort beak; ſome of the ſpines black; 2 inches long.

faſciatus. 12. M. inflated, with rows of ſpines, white, barred with brown; 4 diſtinct turgid whirls in the ſpire.

B. *Suture expanding into criſped foliations; beak abbreviated.* PURPURA.

ramoſus. 13. M. a triple row of foliations; ſpire contiguous; beak truncated. America, Aſia, Red ſea.

foliatus. 14. M. a triple row of foliations; aperture 1-toothed. North America.

ſcorpio. 15. M. 4 rows of foliations; ſpire capitate; beak truncated. Aſia. Very rare.

ſaxatilis. 16. M. 5 rows of foliations; ſpire contiguous; beak abbreviated. Mediterranean, Aſia.

diaphanus. 17. M. white, diaphanous; 6 rows of foliations, which are tipt with black.

cichoreum. 18. M. ochraceous, tranſverſely ſtriated, with numerous rows of foliations.

verſicolor. 19. M. varied with white and red; with flat acute foliations; pointed with black.

erinaceus. * 20. M. Subangular; whirls crowned with tubular and ſuſpinous rays, ſcales or points; beak ſhort and covered; 2 inches long. European ſeas, ſhores of Britain.

ſtriatus. 21. M. 7 rows of foliations, white, with elevated tranſverſe, brown ſtriæ; 7 whirls in the ſpire. India.

triptenus. 22. M. ſhell elongated, triangular, with membranaceous foliations at the angles; 5 whirls in the ſpire. Found foſſil in Campania.

ſacellum. 23. M. umbilicated with muricated ribs; whirls flattiſh above, with acute margins; lip crenated; beak ſtraight, aſcending. Nicobar.

motacilla. 24. M. triangular, knotty, tranſverſely grooved, with a triple row of tubercles; beak long, ſubulate, ſtraight; mouth white. India.

triqueter. 25. M. long, ſubulate, triangular; ribs reticulated; beak ſtraight, cloſed; ſpire pyramidal; with 6 whirls.

C. *With thick, protuberant, rounded ſutures.*

lyratus. 26. M. protuberances croſſed by ſmooth belts; aperture ovate.

rana. 27. M. rough, with oppoſite, impreſſed protuberances, with one or two muricated belts. Aſia.

gyrinus. 28. M. protuberances oppoſite, continued, and barred with tuberculated dots; aperture orbicular. Mediterranean, Atlantic, India.

affinis. 29. M. turgid, with oppoſite continued protuberances; ſpire pointed; whirls ſurrounded with a crown of tubercles; the outermoſt glabrous.

lampas. 30. M. protuberances nearly oppoſite, gibbous, with longitudinal tuberculated protuberances; from 4 to 14 inches long. Indian ocean.

olearium. 31. M. protuberances alternate, and numerous tubercles; back unarmed and ſtriated behind; aperture toothleſs. Mediterranean and African ſeas.

femorale. 32. M. protuberances decuſſated, triangular, wrinkled and knotty on the fore-part; aperture ovate, toothleſs; from 5 to 7 inches long. Aſia, Guinea, and America.

cutaceus. 33. M. with a ſingle protuberance; angular, and a little wrinkled with knots; pillar perforated; aperture toothed; 3 inches long. Barbary, Guinea, South America.

lotorium. 34. M. protuberances decuſſated, angular, with longitudinal tuberculous knots; beak flexuous; aperture toothed. Mediterranean.

pileare. 35. M. protuberances decuſſated, and a little wrinkled with knots; aperture toothed; beak ſubaſcending. Mediterranean.

bufonius. 36. M. ſix oppoſite, continued, vaulted protuberances, and knotty belts; beak oblique. A rare ſhell.

pyrum. 37. M. varicoſe, ovate, tranſverſely grooved and knotty; beak long, flexuous, ſubulate. Indian ocean.

caudatus. 38. M. thin, tranſverſely ſtriated; beak ſubulate; ſpire a little prominent, tipt with brown; whirls grooved; firſt gibbous.

rubecula. 39. M. protuberances decuſſated, obtuſe, with knotty wrinkles; belly equal; aperture toothed. Africa, India, South America. Rare.

ſcrobiculata. 40. M. protuberances hollowed, ſmooth, nearly oppoſite; aperture toothed. Mediterranean.

reticularis. 41. M. protuberances nearly oppoſite, reticulated with tuberculated ſpots; pillar almoſt toothleſs; beak aſcending; 6 inches long. Mediterranean, America.

lamelloſus. 42. M. protuberances membranaceous, continued through the ſpire, and terminated with a ſpine. Falkland iſlands.

nodatus. 43. M. whirls knotty; aperture violet; lip toothed; beak ſtraight. New Holland.

anus. 44. M. protuberances and lips membranaceous, dilated; gibbous and reticulated with tubercles; aperture ſinuous; beak erect; 3 inches long. Mediterranean and Aſia.

miliaris. 45. M. varicoſe, with tuberculated belts; aperture a little toothed; beak elongated; whirls ventricoſe.

ſenegalenſis. 46. M. tranſverſely ſtriated, with ſpinous protuberances; the ſpines decreaſing towards the head; 2½ inches long. Senegal.

carinatus. * 47. M. ventricoſe, with 5 or 6 whirls, forming angular ridges; aperture ſemicircular; beak a little reflected; 4 inches long. Europe, Britain.

D. *More or leſs ſpinous, and without manifeſt beak.*

ricinus. 48. M. obovate, with ſubulate ſpines in rows; aperture and lip toothed; 1½ inch long. Aſiatic ocean.

nodus. 49. M. obovate with conic ſpines; lip toothed; pillar ſmooth, coloured; 3½ inches long.

neritoideus 50. M. knots in numerous rows; lip with pointed angles; pillar flattiſh. India.

fucus. 51. M. coarſe, ventricoſe, tranſverſely ſtriated, with 4 rows of knots; pillar impreſſed; outmoſt whirls flattiſh.

loco. 52. M. obovate and knotty on the fore part; aperture ſuborbicular, toothleſs; 4 or 5 inches long. Chineſe ſhores. Yields a purple fluid.

hyſtrix. 53. M. ſubovate, with acute ſpines in 4 rows; aperture toothleſs, repand.

mancinella. 54. M. ovate, with obſolete ſpines, which are blackiſh: aperture toothleſs; pillar tranſverſely ſtriated.

hippocaſtanum. 55. M. ovate, ſtriated, with 3 or 5 rows of obtuſe ſpines or tubercles; aperture tranſverſely ſtriated. Guinea, India.

ſenticoſus. 56. M. *Small prickly whelk.* Tapering, longitudinally ribbed, and tranſverſely cancellated; aperture ſtriated; ribs prickly; 2 inches long. Indian ocean.

melongena. 57. M. obovate, glaucous, with a ſubſpinous whirl; ſpire ſomewhat prominent; aperture ſmooth; 5½ inches long. India, America.

conſul. 58. M. thick, ventricoſe, tranſverſely grooved and knotted; aperture repand, ovate; lip ſinuous, inwardly plaited and denticulated. India.

lima. 59. M. brown, ſubovate, ſlightly beaked with crowded, nodulous, paler belts. George's bay.

E. *With a long, ſtraight, ſubulate, cloſed beak, and unarmed with ſpines.*

carioſus. 60. M. without beak, ſlightly plaited, ovate, pointed; lip carious. Found in the aqueduct at Seville.

babylonius. 61. M. tapering with acute ſpotted belts, and ſtraight tail; lip cleft; 4 inches long. Indian and American iſlands.

javanus. 62. M. tapering, with immaculate knotty belts; lip with a ſeparate ſcoop. India.

ſinenſis. 63. M. ventricoſe, pointed with a cancellated, reflected beak; aperture oval; whirls with tranſverſe, granulated ſtriæ; baſe crowned with ſpines. Senegal.

ſtramineus. 64. M. ſpire with elevated rings; interſtices filled with ſhort, ſtraw-like projections; whirls crowned with tubercles at the baſe; 3 inches long. Southern ocean.

auſtralis. 65. M. ovate, longitudinally ſtriated; lip undulated; whirls channelled; firſt turgid, and 4-plaited; the next 3-plaited; 2½ inches long. South ſea.

uncinatus. 66. M. ſpire pointed, and tranſverſely ſtriated; 4 firſt whirls with a callus, armed with hooks in the middle, 5 and 6 ribbed, the reſt glabrous.

terris. 67. M. tapering; whirls crowned with tubercles, and ſurrounded with a granulate belt; the firſt finely ſtriated tranſverſely.

coſtatus 68. M. beak a little reflected, and obliquely ſtriated; 3 firſt whirls of the ſpire ribbed; other 4 cancellated;

firſt obconic; pillar with a ſingle plait. Found foſſil in Campania.

aſper. 69. M. longitudinally plaited, and tranſverſely ribbed; ſpire a little prominent; aperture ovate; lip crenulated.

colus. 70. M. tapering, ſtriated, knotty; carinated, with a long ſtraight beak; lip crenulated; beak 3 inches long. Indian ocean.

morio. 71. M. black, with a white band; beak dilated; pillar wrinkled; whirls knotty; 6 inches long. Africa.

cochlidium. 72. M. beak dilated; whirls of the ſpire flat above. Indian ocean.

ſpirillus. 73. M. beak long, ſpire mucronated; whirls convex above. Tranquebar.

canaliculatus. 74. M. beak dilated; whirls of the ſpire ſeparated by a ſmall canal. Canada, Frozen ſea.

ficus. 75. M. beak dilated; whirls ſeparated by a ſmall canal; firſt crowned with knobs at the baſe.

carica. 76. M. tranſverſely ſtriated; beak dilated; ſpire a little prominent; whirls crowned with ſpines at the baſe; 8 inches long.

rapa. 77. M. ſolid, umbilicated, with a triple row of knots tranſverſely ſtriated; aperture largely ſtriated. India.

niveus. 78. M. beak dilated; whirls of the ſpire ſeparated by a ſmall groove; the firſt with tranſverſe carinated ribs. Brazil.

granum. 79. M. hemiſpherical, glabrous, diaphanous; beak ſtraight, ſpreading; crown papillary. North America.

aruanus. 80. M. beak dilated; ſpire crowned with ſpines. New Guinea.

perverſus. 81. M. beak dilated and repand; ſpire recurved and ſlightly crowned. American ocean. Exceedingly rare.

antiquus. * 82. M. beak dilated; ſhell oblong; 8 round whirls, firſt ventricoſe; 4 to 6 inches long. European ſeas, Scotland.

deſpectus. * 83. M. oblong, ſtriated, and ſomewhat rugged; beak dilated; whirls 8, with two elevated lines; five inches long. European ſeas, ſhores of Britain.

fornicatus. 84. M. ovate oblong; beak dilated; whirls ventricoſe; a little angular and longitudinally ſtriated; 7 inches long. Greenland ſeas.

incraſſatus 85. M. oblong, tranſverſely wrinkled, and longitudinally ſtriated; lip denticulated within, and thickened without.

truncatus. * 86. M. oblong, longitudinally ribbed; beak a little reflected, emarginated and truncated: very minute; whirls 6. Coaſts of Europe, and ſhores of Britain.

acuminatus. * 87. M. narrow, oblong, ribbed; ſpire pointed. Shores of England.

argus. 88. M. gibbous, with tranſverſe tuberculated ribs; brown, with darker bands; within white; aperture ovate.

maculoſus. 89. M. cancellated, yellow, with alternate white bands, and cheſnut patches; 11 round whirls in the ſpire. India. Very rare.

magellanicus. 90. M. ventricoſe, umbilicated, tranſverſely ſtriated; whirls of the ſpire with parallel ribs; the firſt large. Straits of Magellan.

cancellatus 91. M. ovate, ſolid, opaque, cinereous; whirls of the ſpire cancellated, and ſeparated by a groove.

ſcolopaceus 92. M. whirls ſurrounded with grooves, and tubercles above; tip of the tubercles and aperture white.

literatus. 93. M. ventricoſe, tapering, ſpotted with black; beak ſhort; pillar with a ſingle plait; ſpire with 8 prickly whirls.

trigonus. 94. M. ſubtriangular, cancellated; ſpire with 7 inflated contiguous whirls; the firſt with a large diſtinct tubercle; 2 inches long. Senegal.

ſemilunaris. 95. M. longitudinally ribbed, and finely ſtriated tranſverſely; ſpire with flattiſh diſtant whirls, with rows of tubercles; aperture ſemilunar; 1 inch long. Senegal.

ſulcatus. 96. M. rounded with annular grooves; aperture oval; firſt whirl of the ſpire turgid; 1½ inch long. Senegal.

tritonis. 97. M. ventricoſe, oblong, ſmooth, with rounded whirls; aperture toothed; beak ſhort; 16 inches long. India and the South ſeas.—This ſhell is uſed by the natives of New Zealand as a muſical inſtrument, and by the Africans and many nations of the Eaſt, as a military horn.

puſio. 98. M. ventricoſe, oblong, ſmooth; ſpire ſtriated with rounded whirls; aperture ſmooth; beak ſhort; 1½ inch long. Mediterranean and Africa. Rare.

tulipa. 99. M. ventricoſe, oblong, ſmooth; whirls rounded with a double ſuture; pillar with two plaits; beak dilated, ſtriated. South America.

clathratus. 100. M. oblong beak, and grooved with longitudinal membranaceous plaits. Iceland.

naſſa. 101. M. ſolid, black or pale brown, with a white ſubdiaphanous band; whirls knotty; pillar a little plaited.

plicatus. 102. M. whirls of the ſpire plaited and knotty.

ſcala. 103. M. umbilicated with diſtant, wedged, ribbed, and tranſverſely ſtriated whirls; aperture heart-ſhaped.

fiſcellum. 104. M. angular, longitudinally plaited, and tranſverſely ſtriated; lip toothed; mouth violet; beak ſtraight, ſhort. China.

corona. 105. M. faſtigiated with brown and yellowiſh bands; beak ſtraight, entire. Mexico.

dolarium. 106. M. ovate, with a few elevated obtuſe belts on the whirls; ſize of a walnut. The ocean.

corneus. * 107. M. oblong, ſlender, white; margins of the whirls complicated; aperture toothleſs; 3 inches long. Britiſh and North ſeas.

lignarius. 108. M. oblong, coarſe, with obtuſely knotty whirls; aperture toothleſs; beak ſhort.

trapezium. 109. M. oblong, obtuſely angular, with ſlightly knotty whirls; aperture toothed; ſix inches long. Indian ocean.

veſpertilio. 110. M. ſolid, ventricoſe, ſmooth, with an oblong oval aperture; beak and crowned ſpire ſtriated; four inches long. Indian ocean.

ſcolymus. 111. M. thin, diaphanous, ventricoſe, and tranſverſely ſtriated; middle of the beak ſmooth; ſpire with obtuſe, undulated knots; pillar 3-plaited.

harpa. 112. M. ventricoſe, longitudinally ribbed; ribs tranſverſely ſtriated; ſpire a little prominent; whirls diſtant.

tuba. 113. M. fuſiform, tranſverſely ſtriated; white, with a brown tip to the ſpire, which has 8 whirls, diſtant, and crowned at the baſe with knots. China.

ſyracuſanus. 114. M. oblong, with ſtriated plaited whirls, covered, with tuberculated ridges; aperture toothleſs; beak ſhort. Mediterranean; rare.

craticulatus. 115. M. oblong, with rounded, plaited, and tranſverſely reticulated whirls; aperture toothed, ſtriated within. Mediterranean.

ſcriptus. 116. M. nearly without beak; fuſiform, ſmooth, pale, with longitudinal brown ſtriæ; lip toothed; very ſmall. Mediterranean.

ternatanus 117. M. tranſverſely ſtriated, with diſtant undulately tuberculated whirls; aperture oblong; beak ſtraight; 4 inches long; yellow. Ternate iſland.

infundibulum. 118. M. umbilicated, undulately knotty; ſtriæ elevated, brown; perforation funnel-ſhaped; pillar two-plaited; 4 inches long; very rare.

polygonus. 119. M. ventricoſe, undulated with tubercles; ſtriated, grooved, and obtuſely angled; black, with an oval aperture, and ſhort beak; $3\frac{1}{2}$ inches long. Indian ocean.

icelandicus. 120. M. tranſverſely ſtriated; ſpire papillous at the tip, with round whirls; firſt large and ventricoſe; 5 inches long. Iceland.

lævigatus. 121. M. fuſiform; ſpire tranſverſely ſtriated; whirls diſtant, flattiſh; the firſt round, ſmooth; $3\frac{1}{2}$ inches long. Found foſſil in Campania.

foſſilis. 122. M. fuſiform, incancellated, with a long beak; $1\frac{1}{2}$ inch long. Found foſſil in Campania.

candidus. 123. M. ſnowy, tranſverſely ſtriated; ſpire with diſtant whirls; keeled in the middle, and crowned with tubercles; lip grooved within, and denticulated at the margin; $9\frac{1}{2}$ inches long.

anſatus. 124. M. brown, tranſverſely ſtriated, ſpire mucronated; whirls diſtant, convex, and knotty at the baſe; beak long.

undatus. 125. M. ſolid, ventricoſe, with waved angles, and finely ſtriated tranſverſely; ſpire mucronate; whirls knotty at the baſe; lip denticulated; $8\frac{1}{2}$ inches long; ponderous. India.

longiſſimus 126. M. thin, ſtriated, with an obtuſe, knotty ſpire, and long ſtraight beak; 9 inches long. India.

lancea. 127. M. narrowed; whirls of the ſpire tranſverſely ribbed, and longitudinally crenated; aperture ovate; ribbed with white within, and toothed at the margin; pillar 2-plaited. Amboyna.

anguſtus. 128. M. narrowed; firſt whirl of the ſpire longitudinally plaited, and tranſverſely ribbed; the other ſmooth and round; beak tranſverſely ſtriated.

verſicolor. 129. M. ſubcylindrical; ſpire obtuſe; whirls round and ſtriated; lower ones moſtly glabrous. India.

verrucoſus 130. M. umbilicated and ſurrounded with belts; middle ones more raiſed; whirls crowned with tubercles, which are ſpotted with brown. Red ſea.

ſtriatulus. 131. M. thin, tranſverſely ſtriated; ſpire mucronate; whirls round; lip crenulated; 4 inches long.

pardalis. 132. M. rounded, white, with violet ſpots, longitudinally ribbed, and tranſverſely ſtriated; ſpire obtuſe.

gigas. 133. M. whirls of the ſpire turgid, gibbous, nodulous and annulated; lip denticulated beneath; 21 inches long.

lignoſus. 134. M. whitiſh; ſpire obtuſe; whirls ſlightly crowned with wrinkled, unequal tubercles; beak tranſverſely ſtriated; $1\frac{1}{2}$ inch long.

gibbulus. 135. M. tapering, orange; ſpire obtuſe; whirls diſtant, with longitudinal ribs, and flexuous tranſverſe ſtriæ.

136. M. tapering; ſpire with contiguous whirls, ſeparated by a flexuous line; firſt ventricoſe; Adriatic. *granularis.*

137. M. tapering, tranſverſely ribbed; whirls convex; aperture oval; lip denticulated. *vexillum.*

138. M. oblong, ventricoſe; whirls with a ſtriated margin; aperture glabrous; beak ſhort, and bent outwards. *vulpinus.*

139. M. ovate, tranſverſely ſtriated; ſpire with flattiſh whirls; crowned with a row of rounded tubercles; $1\frac{1}{2}$ inch long. Senegal. *afer.*

140. M. ventricoſe; ſpire obtuſe, cancellated, with carinated whirls; firſt ventricoſe and ſmooth; beak long and ſmooth; three inches long. Found foſſil in Campania. *campanicus.*

141. M. whirls of the ſpire with decuſſated ribs, the firſt large, three outermoſt ſmooth; lip toothed outwardly; very ſmall. Sandy ſhores of India. *arenoſus.*

142. M. narrow, tranſverſely ſtriated; ſpire mucronated; whirls diſtant, contrary, round, and longitudinally ribbed; beak prominent; $1\frac{1}{2}$ inch long. Shores of Morocco. *maroccenſis.*

143. M. oblong, whitiſh, with tranſverſe, reddiſh ſtriæ; beak ſhort, ſtraight. New Zealand. *lineatus.*

144. M. a little tapering; whirls carinated above, margined and flattened; beak long and ſtraight. Southern ocean. *perron.*

145. M. cylindrical; ſpire with a crenated callous belt; upper whirls with plaited knots, lower ones flattiſh; beak ſhort, ſtraight, emarginated. *larva.*

146. M. ſolid, thick, coarſe; ſpire exſerted; whirls tranſverſely ſtriated; aperture ſemiorbicular and ſtriated. *neretoideus.*

147. M. ovate, angular, irideſcent; longitudinally grooved and plaited; beak ſhort; lip denticulated. India, and South ſeas. *priſmaticus.*

148. M. ribs longitudinally plaited, and tranſverſely grooved; angular, ſpinous, carinated; alternately varied with white and brown; whirls ſuddenly diminiſhing; beak ſhort, ſtraight. Pulo Condor. *columbarium.*

149. M. ribbed, varied with brown, yellow and white; whirls oblique, with a tuberculated margin, and brown band in the middle; beak ſhort, dilated, aſcending; 2 inches long. *aſperrimus.*

150. M. white, undulated with bay; with grooves marked with raiſed ſtriæ; whirls nodulous at the margin; beak ſtraight: four inches long. Red ſea. *undulatus.*

F. *Tapering, ſubulate, with a very ſhort beak.*

151. M. whirls of the ſpire plaited above; pillar plaited within; beak aſcending; three inches long. India. *vertagus.*

152. M. whirls of the ſpire tuberculated, with a ſpinous ſtreak in the middle; pillar with a ſingle plait; beak aſcending; four inches long. Southern ocean, Red ſea, Atlantic. *aluco.*

153. M. whirls ſurrounded with belts longitudinally ſtriated; firſt whirl tranſverſely ſtriated; beak aſcending. *annularis.*

154. M. ventricoſe; ſpire tranſverſely ſtriated; whirls longitudinally plaited and knotty; aperture oval. *plicatulus.*

155. M. ventricoſe, tranſverſely ſtriated and crowned with black knots; lip dilated. *ſordidus.*

156. M. ſpire tranſverſely ſtriated and grooved; *cingulatus.*

whirls ſurrounded with three rows of granulations, the firſt a little knotty. Tranquebar.

fuſcus. 157. M. rounded, brown; firſt whirl of the ſpire gibbous; the others varicoſe; the laſt with numerous ſpines.

faſciatus. 158. M. tranſverſely ſtriated; ſpire crowned. Rivers of America.

fluviatilis. 159. M. brown; firſt whirls of the ſpire crowned with ſpines, the others with knots; aperture repand.

alatus. 160. M. reticulated; ſpire mucronate; firſt whirl grooved and tranſverſely ſtriated; lip winged.

noduloſus. 161. M. tranſverſely ſtriated, and alternately barred with brown and white; ſpire mucronate; whirls diſtant, with undulated knots.

terebella. 162. M. with a triple moniliform belt on each of the whirls; aperture oval, with curved ſtriæ within; 1 to 2½ inches long.

fuſcatus. 163. M. whirls crenulated; the upper ſtria denticulated. Mediterranean.

toruloſus. 164. M. whirls of the ſpire with a ſlightly knotty zone above; beak ſhort.

radula. 165. M. whirls of the ſpire tuberculated, with a double row of punctured ſtriæ. Africa.

aſper. 166. M. whirls of the ſpire grooved, tranſverſely ſtriated and muricated. Guinea.

granulatus 167. M. rough, with decuſſated tubercles; beak acute, aſcending; 2 inches long; white. India.

decollatus. * 168. M. whirls of the ſpire with longitudinal plaited grooves, with the tip ſeemingly broken off. European ſeas. Britain.

moluccanus. 169. M. ſtriated; whirls of the ſpire tranſverſely grooved with undulated, longitudinal plaits; lip dilated, crenulated. Marſhes of Molucca iſlands.

minimus. 170. M. with tranſverſe, undulated ſtriæ, croſſed by longitudinal lines; aperture orbicular.

ſtrigilatus. 171. M. longitudinally ſtriated; whirls undivided, with a ſnowy belt at the ſuture, marked with reddiſh ſpots.

tuberculatus. 172. M. tranſverſely ſtriated, and ſurrounded with glabrous knots; lip thickened.

gibboſus. 173. M. whirls of the ſpire margined; belly gibbous; lip cleft, denticulated; beak ſhort.

atratus. 174. M. black; whirls tranſverſely ſtriated and tuberculated; pillar with one plate.

contrarius. 175. M. four contrary whirls marked with double ſtriæ; beak dilated. European and North ſeas.

eburnea. 176. M. contrary, hyaline, with 6 finely crenulated whirls.

conditus. 177. M. tapering, rough with granulations; lip doubled, emarginated on each ſide, and toothed within; aperture oval and ſtriated.

clava. 178. M. tranſverſely ſtriated and ſpotted; whirls with plaited knots; lip double, dilated. Pulo Condor.

hexagonus. 179. M. yellowiſh, hexagonal, with tranſverſe, granulated ſtriæ; firſt whirl tuberculated. South ſea; and is often found foſſil.

minutiſſimus. * 180. M. with five whirls, ſpirally ſtriated, and remote ribs; pellucid; a very minute and elegant ſhell. Coaſts of Wales.

55 Trochus.

Gen. 27. TROCHUS.

Gen. Char.—The animal a limax; ſhell univalve, ſpiral, more or leſs conic; aperture ſomewhat angular or rounded; the upper ſide tranſverſe and contracted; pillar placed obliquely.

SPECIES.

A. *Erect, with the pillar perforated.*

niloticus. 1. T. conic, ſmooth, ſomewhat umbilicated; a large ponderous ſhell, with oblique, red, perpendicular ſtriæ. Indian ocean.

maculatus. 2. T. conic, tuberculated, with an oblique perforation; inner lip two-lobed. Aſia, South America.

perſpectivus. 3. T. convex, obtuſe, margined; the umbilicus pervious and crenulated, 2¼ inches long. Aſia, Africa. This is a very beautiful ſhell.

hybridus. 4. T. convex; pillar 2-toothed; perforation crenulated. Mediterranean.

cruciatus. 5. T. convex, with callo-punctured ſtriæ; pillar 1-toothed. Mediterranean.

pharaonis. 6. T. obovate, ſtriated; marked with concatenated, globular dots; aperture and pillar toothed; umbilicus crenated. European and Aſiatic ſeas.

magus. * 7. T. convex, obliquely umbilicated; ridges of the whirls riſing into obtuſe tubercles. European and African coaſts, Britain.

modulus. 8. T. ſtriated, plaited above, and more convex beneath; aperture ovate and 1-toothed. Red ſea.

ſcaber. 9. T. ſubovate; grooves moniliform and alternately larger; ſhell black; aperture yellowiſh.

varius. 10. T. obliquely umbilicated; convex; whirls ſlightly margined. Mediterranean.

cinerarius. * 11. T. ovate, obliquely umbilicated; whirls rounded; ſize of a pea. Shores of Europe. Britain.

divaricatus. 12. T. ovate, ſubumbilicated; perforation nearly ſhut up; loweſt whirl more remote. Mediterranean and Greenland ſeas.

umbilicaris. 13. T. conico-convex; perforation pervious, exactly cylindrical; whirl ſlightly emarginated. Shores of Europe.

ſolaris. 14. T. convex, conic; whirls ſpinous and margined; aperture ſemi-heart-ſhaped; 2 inches diameter. India and America.

tectum. 15. T. depreſſed, oblique; white with brown lines; ſpire tranſverſely ſtriated, and longitudinally ribbed; firſt whirl ventricoſe; aperture orbicular; firſt whirl large; pillar brown.

conus. 16. T. conic, white ſpotted with red; whirls round, with moniliform belts; firſt whirl only perforated. India.

ſpinoſus. 17. T. ſubequal, mucronate; whirls 9, ſpinous beneath; on each ſide a linear band of white and black, with a triple row of knots.

jujubinus. 18. T. lateritious, ſpotted with white; the baſe flat, with concentric lines of concatenated dots; whirls channelled, teſſelated at the lower margin with white and cheſnut. South America.

alveare. 19. T. plaited with knots, tranſverſely ſtriated, with belts of concatenated dots; perforation funnel-ſhaped; pillar crenulated. India.

concavus. 20. T. baſe and continued perforation funnel-ſhaped; whirls contiguous, undulated and plaited; aperture denticulated at the margin; 2 inches broad. India.

vernus. 21. T. ſurrounded with granulations and knots, green, and whitiſh towards the tip; the tip varied with black dots. India.

conſperſus. 22. T. covered with white, greeniſh, and buff-coloured ſpots; tip with red and black ones; baſe white ſpotted with red; within pearly; whirls with many rows of knots; lower margins glabrous. India.

tentorium. 23. T. wrinkled and plaited; whirls knotty beneath, with concatenated dots in the middle; whirls diſtant; perforation funnel-ſhaped. India.

ochroleucus. 24. T. wrinkled and plaited, obliquely crenated and tranſverſely ſtriated; baſe flat; white with red dots. India.

ſtellatus. 25. T. plaited and wrinkled, ſea-green; whirls with concatenated dots; upper ones with a radiated ſpinous margin. India.

ſpengleri. 26. T. ſurrounded with rows of ochraceous knots and granulations, waved with red; one part of the baſe ſmooth.

coſtatus. 27. T. dots elevated, concatenated; whirls with oblong white knots beneath, and intermediate purple grooves.

inæqualis. 28. T. rough, with unequal knots and granulations; many rows of knots on the whirls; tubercles larger on the marginal row.

regius. 29. T. white, with a roſy ſhade; tranſverſely ſtriated, with many rows of knots; margin of the whirls prominent; perforation funnel-ſhaped.

verrucoſus. 30. T. white, radiated with purple; conic; margin of the whirls knotty; perforation funnel-ſhaped.

cylindricus 31. T. browniſh, cylindrical; whirls convex, marked with tranſverſe ſtriæ; perforation crenated. Very rare.

radiatus. 32. T. radiated with red; pyramidal; whirls with concatenated dots; perforation funnel-ſhaped. South America.

viridis. 33. T. green; firſt whirl with 5 rows of knots, ſecond with 4, the reſt glabrous.

ruſticus. 34. T. black-brown; obtuſely pyramidal. China.

nigerrimus. 35. T. deep black; whirls flattiſh; ſpire tranſverſely ſtriated; pillar 1-toothed. China.

fanulum. 36. T. whirls of the ſpire ochraceous, with ſpotted tubercles; and with an intermediate, ſpotted, wrinkled groove.

ſtrigoſus. 37. T. ochraceous, varied with black at the tip; pyramidal and tranſverſely ſtriated; whirls of the ſpire flattiſh; margin tumid and ſpotted with red; very ſmall. Shores of Morocco.

pyramis. 38. T. pyramidal, with cheſnut ſpots and clouds; margin of the whirls vaulted and nodulous; ½ to 2 inches long.

capenſis. 39. T. depreſſed, varied with white and cheſnut; baſe convex, with a ſcarlet ring marked with deeper ſpots. Cape.

ægyptius. 40. T. depreſſed, white ſpotted with red; whirls tranſverſely ſtriated and plaited, diſtant; pillar 1-toothed; ½ inch long. Red ſea.

depreſſus. 41. T. whitiſh, radiated with red, and red at the tip; depreſſed; whirls ſurrounded with a belt of moniliform dots.

lævigatus. 42. T. pale brown; baſe ſub-convex; whirls ſmooth, obſoletely ſtriated tranſverſely; perforation white, funnel-ſhaped.

grœnlandicus. 43. T. pellucid, fleſh-colour; baſe convex; whirls 6; convex and finely ſtriated tranſverſely.

roſeus. 44. T. convex, roſy, grooved; perforation very minute; ſhell ſmall. Cape of Good Hope.

petholatus. 45. T. depreſſed, brown, with whitiſh ſpots; very minute.

viridulus. 46. T. greeniſh, obliquely radiated with white; whirls convex, with a belt of moniliform granulations; pillar toothed.

urbanus. 47. T. convex, with numerous rows of granulations; perforation denticulated; aperture crenulated.

guineenſis. 48. T. clouded with brown and gray; rows of granulations numerous, with knots; aperture crenated; perforation toothed; 6 lines long. Guinea.

nodulus. 49. T. cinereous, with moniliform belts of granulations; perforation white, toothed; aperture crenated.

carneus. 50. T. depreſſed, pale fleſh colour, with crowded moniliform belts of granulations; perforation large; 1-toothed.

teſſelatus. 51. T. tranſverſely ſtriated; whirls diſtant; numerous ſquare ſpots on the ſpire. European ſeas.

croceus. 52. T. convex, cheſnut; whirls of the ſpire convex, the outer ones ſaffron-coloured. Africa.

obliquatus. 53. T. depreſſed, convex, with oblique violet rays; whirls convex. Mediterranean.

vittatus. 54. T. convex, cheſnut; whirls with a fillet, varied with red and white at the upper margin.

ſchrœteri. 55. T. depreſſed, pyramidal; baſe concave; whirls tranſverſely ſtriated and obliquely ribbed, the firſt with a keeled margin; perforation funnel-ſhaped. Found foſſil in Campania.

indicus. 56. T. conic-convex; whirls unarmed; aperture ſemi-heart-ſhaped; perforation ſpiral; ſcarcely 1 inch high. India.

infundibuliformis. 57. T. depreſſed, cheſnut; whirls tranſverſely ſtriated and crenated, with rows of granulations; perforation pervious, crenulated.

ſtramineus. 58. T. ſtraw colour; whirls convex, with decuſſated ſtriæ ſeparated by a groove; perforation pervious. Tranquebar.

variegatus. 59. T. white, marked with browniſh rays and crenated ſtriæ; perforation crenated, pervious.

areola. 60. T. convex, tranſverſely ſtriated; white, with ſquare reddiſh ſpots; perforation crenulated; whirls of the ſpire ſeparated by a white ſtreak.

inermis. 61. T. greeniſh yellow, with longitudinal plaited ribs terminated by a ſpine; aperture compreſſed; perforation wrinkled.

imperialis. 62. T. conic, olive, covered with rows of raiſed violet ſcales; whirls inflated, with a ſpinous radiate margin; ſpire with 7 whirls; large. South ſeas.

planus. 63. T. depreſſed, ſtraw colour, with darker ribs; whirls of the ſpire plaited; perforation pervious.

albidus. 64. T. conic; white, with oblique brown bands; whirls channelled near the future.

fuſcatus. 65. T. conic; baſe greeniſh gray, ſpotted with brown; whirls round, flattiſh at the future.

corallinus. 66. T. conic; red, dotted with white; ſlightly perforated; whirls round, the firſt with 15, the next with 6 rows of tubercles; 6 whirls in the ſpire; 4 lines long. Senegal.

griſeus. 67. T. gray, with whitiſh ſpots; whirls flattiſh, and tranſverſely grooved. Senegal.

ferrugineus. 68. T. convex; the whirls reverſed. Found near Scaphuſia, converted into iron ore.

novus. 69. T. pyramidal, with contrary round whirls; 3 of them with a quadruple trifarious row of tubercles, the fourth very diſtant.

fragilis. 70. T. very thin, and of a wax colour; firſt whirl large, with a brown band in the middle.

calloſus. 71. T. obtuſely pyramidal; 4 elevated contiguous whirls, tumid at the margin, in the ſpire.

afer. 72. T. convex, gray with whitiſh ſpots; whirls flattiſh; 6 lines long. Senegal.

neritoideus 73. T. ſub-ovate, convex, depreſſed; ſmooth, reddiſh, glabrous; 2 lines long. Greenland.

perlatus. 74. T. reddiſh, with elevated dots; unequally ribbed; ſpire depreſſed: whirls convex.

terreſtris. * 75. T. conic; livid; minute. Mountains of Cumberland.

fuſcus. * 76. T. opaque, brown, margined; aperture roundiſh; ſpires 5. Sandwich.

B. *Imperforated, erect; umbilicus cloſed.*

veſtiarius. 77. T. conic, convex, with a gibbous callous baſe; aperture ſomewhat heart-ſhaped; very ſmall. Mediterranean and Aſia.

labio. 78. T. ovate, ſub-ſtriated; pillar 1-toothed. Aſia, Africa, New Zealand.

tuber. 79. T. depreſſed; whirls ſomewhat keeled, and knotted at the upper and lower margin; 2 inches diameter. Mediterranean and South America.

ſtriatus. * 80. T. conic; aperture obovate; laſt whirl angular; minute. Mediterranean; Falmouth.

conulus. * 81. T. conic, ſmooth; whirls ſeparated by a prominent line. European ſea; Britain.

ziziphinus. * 82. T. conic, livid, ſmooth, tranſverſely ſtriated; whirls margined. European and African coaſts, ſhores of Britain.

obeliſcus. 83. T. conic; ſurrounded with numerous rows of white or green moniliform granulations; pillar 1-toothed; 2 inches high. India.

diſtortus. 84. T. ſolid, white, poliſhed; ſtriated, diſtorted, and obtuſe at the tip; firſt whirl gibbous; aperture compreſſed, ovate.

virgatus. 85. T. pyramidal, with roſy and white ſtripes, and numerous rows of knots; baſe with concentric white and red circles. India.

foveolatus. 86. T. cinereous, variegated with greeniſh, whitiſh, and reddiſh; whirls of the ſpire tuberculated at the lower margin. Red ſea.

diaphanus. 87. T. thin, pellucid, with alternate cheſnut and white moniliform belts of granulations; 1½ inch high. New Zealand.

iris. 88. T. covered with a ſmooth coat, under which it is bluiſh and reddiſh, ſhining with irideſcent. Southern ocean.

roſtratus. 89. T. pyramidal, tranſverſely ſtriated; varied with white and red; tip green, pellucid; 1 inch high. South ſea.

notatus. 90. T. ſtriæ decuſſated; grooved within; tip deep red.

elegans. 91. T. pyramidal, ſtriated, browniſh purple. South ſea.

melanoſtoma. 92. T. obtuſely pyramidal; ſpotted with greeniſh. South ſea.

erythroleucus. 93. T. pyramidal; ſtriated with white and red. Morocco.

punctulatus. 94. T. red, punctulated; very minute. Morocco.

imbricatus. 95. T. pyramidal, obliquely grooved, plaited and ribbed; whirls a little prominent at the margin. South American ſeas.

americanus. 96. T. ochraceous; longitudinally grooved; whirls tranſverſely ſtriated; lip denticulated. South America.

cœlatus. 97. T. ſea-green, with protuberances and oblique ſcaly plaits; whirls of the ſpire tranſverſely ſtriated and grooved in the middle, concave ſpines on the lower margin of the firſt whirl.

98. T. purple, with plaited tuberculated whirls. *purpureus.*

99. T. ſea-green, with numerous rows of tubercles and oblique undulated plaits; 4 inches long, as broad, and covered with a horny lid. Cooke's bay. *cookii.*

100. T. browniſh, with a convex baſe; whirls with a ſingle row of tubercles, firſt with 2. South ſeas. *noduloſus.*

101. T. pyramidal; white, varied with reddiſh and green; whirls ſpinous; pillar emarginated, plaited. Bourbon and Mauritius iſlands. *mauritianus.*

102. T. pyramidal; white; whirls of the ſpire longitudinally ribbed, with tranſverſe moniliform belts of green granulations: 1½ inch wide. Indian and South ſeas. *feneſtratus*

103. T. convex on each ſide, ſolid; ſpire ſmooth; 2 firſt whirls obliquely ribbed. South ſeas. *helicinus.*

104. T. ovate, with undulated ribs and tranſverſe ſtriæ; whirls ventricoſe; 2 inches broad and high. South ſea. *argyroſtomus.*

105. T. obtuſely pyramidal; black, with a purple band at the baſe; pillar white. China. *ſinenſis.*

106. T. black, with a ſub-convex granulate baſe; minute, with 5 whirls. South ſeas. *lugubris.*

107. T. obtuſe; whirls round, with many rows of tubercles, grooved and tranſverſely ſtriated; pillar toothed. *aſper.*

108. T. conic, convex, tranſverſely ſtriated, with oblong ſquare ſpots diſpoſed in rows; pillar lip ſpotted with black. Mediterranean, Africa. *teſſelatus.*

109. T. conic, convex; citron, with angular black lines. Aſia. *citrinus.*

110. T. pyramidal, white, variegated with ſcarlet; 2 firſt whirls very large; 2 inches high. South ſeas. *granatum.*

111. T. ſmooth, conic, white with a ſaffron tip. *crocatus.*

112. T. whirls round, and obſoletely plaited; aperture compreſſed, browniſh; 2 inches high. South America. *conchyliophorus.*

113. T. convex; white, with green, brown, and fulvous ſpots; 2 rows of tubercles on the whirls; 8 lines long. Senegal. *pantherinus.*

114. T. rough, with concatenated globules; baſe convex, with concentric, granulated ſtriæ; lip double-toothed. Palmerſton iſland. *grandinatus.*

115. T. depreſſed, with belts dotted with white beneath; whirls crowned with ſpines. Friendly iſlands. *inæqualis.*

116. T. gray, with red ſtripes, and tranſverſely ſtriated with white. New Zealand. *tigris.*

117. T. conic, brown, obliquely ſtriated with black. George's bay. *pulligo.*

* 118. T. conic, white; whirls 4, tuberculated. Pembrokeſhire coaſt. *parvus.*

C. *Tapering, with an exſerted pillar, and falling on the ſide when placed upon the baſe.*

119. T. imperforated, ſtriated; pillars ſpiral: 4 inches long. Indian ocean. *teleſcopium.*

120. T. umbilicated, glabrous; pillar with recurved twiſted plaits. South America. *dolabratus.*

121. T. glabrous, imperforated; whirls reverſed; ſmall. Mediterranean. *perverſus.*

122. T. flat at the baſe; finely ſtriated tranſverſely; whirls reverſed; ¼ inch long. Indian ſeas. *puſillus.*

123. T. flat at the baſe; longitudinally ribbed; whirls reverſed. Indian ſhores. *undulatus.*

ventricoſus. 124. T. cancellated, glabrous at the baſe; whirls reverſed; upper ones ventricoſe; very ſmall. Indian ſands.

annulatus. 125. T. aperture nearly ſquare; whirls reverſed, and ribbed on each ſide; ſmall. Indian ſands.

flumineus. 126. T. ſub-pyramidal, umbilicated, ſmooth; white, with a reddiſh tip; whirls ſeparated by a groove.

punctatus. 127. T. whirls with a triple row of prominent dots; imperforated; ſize of a barleycorn. Southern Europe, Africa.

ſtriatulus. 128. T. imperforated; longitudinally and obliquely ſtriated; ſmall. Mediterranean.

zigzag. 129. T. ſubſtriated, and marked with darker angular lines; whirls 5 or 6.

lunaris. 130. T. whirls 5, reverſed; convex, ſmooth, umbilicated.

hortenſis. 131. T. white, with a reddiſh band; pyramidal, nearly imperforated. In gardens in warmer climates.

56
Turbo.

Gen. 28. TURBO, *the Wreath.*

Gen. Char.—The animal a limax; the ſhell univalve, ſpiral, ſolid; aperture contracted, orbicular, entire.

SPECIES.

A. *Pillar margin of the aperture dilated and imperforated.*

obtuſatus. 1. T. roundiſh, ſmooth, very obtuſe; above ventricoſe. North ſeas.

neritoides. 2. T. ovate, glabrous, obtuſe; minute. Mediterranean, America.

littoreus. * 3. T. *periwinkle;* ſubovate, acute, ſtriated; 1¼ inch high; finely ſtriated tranſverſely. Shores of Europe; Britain. The animal of this ſpecies is frequently eaten.

tumidus. * 4. T. pale red; 5 diſtinct, tumid, ſtriated whirls; firſt ventricoſe. England, in woods; very rare.

rudix. * 5. T. ſmooth; whirls 5, diſtinct, tumid. Weſtern ſhores of England.

lineatus. 6. T. ſomewhat conic, cinereous; variegated with fine zig-zag black ſtreaks. Weſtern coaſts of England.

muricatus. 7. T. umbilicated, ſubovate, acute; ſurrounded with ſtriæ of raiſed dots; pillar margin a little obtuſe; an inch high. Europe, America.

lituus. 8. T. ſubovate, ſmooth; aperture lateral, margined; umbilicus covered. Pulo Condor.

punctulatus. 9. T. ſubovate, ſmooth, brown, with paler, flat, dotted belts.

B. *Solid, imperforated.*

cimex. * 10. T. oblong ovate; ſtria decuſſated and raiſed with dots; very minute. Shores of Europe, Britain.

pullus. * 11. T. ovate, ſmooth; variegated with red and white; minute, tranſparent, gloſſy. European ſeas, ſhores of Britain.

faſciatus. * 12. T. oblong, white, marbled, or banded with black; 6 tumid whirls in the ſpire; ½ inch long. Coaſts of Wales.

perſonatus. 13. T. convex, ſmooth; aperture ſomewhat angular. India.

petholatus. 14. T. ovate, ſmooth, gloſſy; whirls ſomewhat angular on the upper part. India, South America.

cochlus. 15. T. ovate, ſtriated, with one ſtria thicker on the back. India.

chryſoſtomus. 16. T. ſubovate, wrinkled; whirls ſurrounded with two rows of vaulted ſpines; yellowiſh, radiated with brown. India.

17. T. ſubovate, wrinkled, with obtuſe vaulted ſpines and whirls; pillar lip expanded, crenated. South ſea, and Friendly iſlands. *echinatus.*

18. T. ovate; ſpines obtuſe, depreſſed; beneath papillous. India. *tectum perſicum.*

19. T. conic; ſpines obtuſe, concatenated; ſtriæ papillous beneath; 3 inches high. India. *pagodus.*

20. T. ſubconic; variegated with black and gray, and covered with hollow ſcales. Friendly iſlands. *ſulcatus.*

21. T. nearly imperforated, depreſſed; whirls rough; with compreſſed hollow ſpines above. India. *calcar.*

22. T. ſubovate, ſtriated; whirls rugged above. Mediterranean, New Zealand. *rugoſus.*

23. T. ſubovate, ſmooth; 3 rows of protuberances in the whirls; beak dilated behind. South America. *marmoratus.*

24. T. convex, obtuſe; whirls knotty above, and ſeparated by a canal. Aſiatic and African ſeas. *ſarmaticus*

25. T. convex, obtuſe, ſmooth, angular. India. *olearius.*

26. T. whirls and ſpire round, with decuſſated ſtriæ; the firſt with 3 rows of imbricated ſpines; a large ſhell. China. *cornutus.*

27. T. rugged; whirls round, diſtant, tranſverſely ſtriated, and armed with ſmall imbricated ſpines. Red ſea. *radiatus.*

28. T. glabrous, gloſſy green; within ſnowy; aperture ſilvery; pillar lip callous above; whirls of the ſpire very convex. *imperialis.*

29. T. wrinkled; white, with greeniſh clouds; tip orange; whirls crowned with ſpines and knots; pillar produced into a beak. Seas of Malacca. Very rare. *coronatus.*

30. T. grooved and tranſverſely ſtriated; whirls 6, very convex. India. *canaliculatus.*

31. T. whirls of the ſpire cylindrical; grooved and tranſverſely ſtriated. India. *ſetoſus.*

32. T. oblong, with broad, ſmooth ſtriæ; yellowiſh ſpotted with brown. India. *ſparverius.*

33. T. oblong, tranſverſely ſtriated; ſtriæ ſpinous; aperture ſilvery. India. *ſpinoſus.*

34. T. ſilvery gray, with tranſverſe orange and yellow bands; whirls of moniliform belts of granulations. *moltkianus.*

35. T. variegated white and yellowiſh; whirls round, tranſverſely ſtriated, and ſeparated by a canal. Indian ocean. Very rare. *ſpenglerianus.*

36. T. tranſverſely ſtriated; cheſnut brown, ſpotted with white; whirls 5, ſurrounded with rows of knots. South America. *caſtanea.*

37. T. ſilvery gray, ſurrounded with many rows of knots; aperture milk-white within. *crenulatus.*

38. T. ponderous, ſlightly depreſſed; ſmoothiſh and obliquely wrinkled; 4 whirls in the ſpire; firſt round and larger; 2 inches broad and high. New Zealand. *ſmaragdus.*

39. T. pellucid, thin and finely annulated; firſt whirl large, the next with a band varied with red and white. *papyraceus.*

40. T. tranſverſely grooved; firſt whirl black, finely ſtriated; the reſt ſilvery; lips bordered with brown. *æthiops.*

41. T. browniſh, reticulated; whirls ſurrounded with belts; throat golden. Nicobar iſlands. *nicobaricus.*

42. T. ſmooth, with compreſſed roundiſh whirls; the firſt round and very large; aperture compreſſed, ſilvery; pillar a little prominent. India, China. *cidaris.*

nigerrimus 43. T. ſmooth, deep black; whirls diſtant, with a hollowed margin. Southern ocean.

helicinus. 44. T. ſmooth, nearly imperforated; roundiſh, with contiguous convex whirls; pillar thickened.

punctatus. 45. T. ovate, thick, with a mucronate ſpire; whirls ſmooth, flattiſh; the two firſt very large; 6 lines long. Senegal.

hæmaſtomus. 46. T. ovate, ſolid, glabrous; whirls 6, ſtriated; aperture margined, oval.

torquatus. 47. T. ovate, with convex tranſverſe grooves, and rugged ſtriæ; whirls with a knotty belt. New Zealand.

undulatus. 48. T. ovate, convex, with longitudinal undulated ſtreaks; ſpire obtuſe; mouth ſilvery. New Zealand.

niveus. 49. T. ſpiral, ſnowy, diaphanous, tranſverſely ſtriated; whirls often diſtorted. Nicobar iſlands.

helicoides. 50. T. horny, ſubdiaphanous, ſmoothiſh; ribs 3; whirls diſtant; aperture triangular. Indian ocean.

nitidus. * 51. T. ſmooth, obtuſe; whirls 4; aperture oval. Pembrokeſhire coaſt.

ſcriptus. * 52. T. ſmooth, opaque; whirls 3, with brown lines reſembling characters; aperture roundiſh; minute. Pembrokeſhire coaſt.

coſtatus. * 53. T. opaque; 4 whirls deeply ribbed longitudinally, and finely ſtriated tranſverſely. Devonſhire.

ſubluteus. * 54. T. opaque; 5 longitudinally ribbed whirls; aperture rounded, margined; minute. Pembrokeſhire coaſt.

albulus. * 55. T. opaque; whirls 5, longitudinally ribbed; aperture roundiſh; not margined. Pembrokeſhire coaſt.

reticulatus. * 56. T. white, opaque; whirls 4, reticulated. Pembrokeſkire coaſt.

ruber. * 57. T. opaque, ſmooth, with 5 whirls. Cornwall.

interſtinctus. * 58. T. pellucid, ſmooth; whirls 5, finely ribbed. Devonſhire.

ſtriatus. * 59. T. pellucid, white; whirls 5, ſeparated by a fine rib. Plymouth.

ſubarcuatus. * 60. T. pellucid, white, curved towards the tip; whirls 10, longitudinally ribbed. Pembrokeſhire coaſt.

æreus. * 61. T. pellucid; whirls longitudinally ribbed; braſſy between the ribs. Pembrokeſhire coaſt.

elegans. * 62. T. pellucid; whirls 6, ſpirally ſtriated; ribs remote. Pembrokeſhire coaſt.

pellucidus. * 63. T. pellucid, white, with 5 reticulated whirls. Pembrokeſhire coaſt.

canaliculatus. * 64. T. pellucid, whitiſh; whirls 5, longitudinally grooved. Pembrokeſhire coaſt.

diviſus. * 65. T. pellucid, white; whirls 4, each divided into 2 parts; upper one ſmooth; the lower one ſpirally ſtriated. Pembrokeſhire ſands.

C. *Solid, perforated.*

pica. 66. T. conic, rounded, ſmooth; a ſmall tooth near the umbilicus; 3½ inches broad. In moſt ſeas.

ſanguineus 67. T. umbilicated, conic, convex, ſtriated and ſmooth; whirls ſlightly grooved; ſize of a pea. Africa.

argyroſtomus. 68. T. ſubovate, with tranſverſely ſtriated lines on the back. India.

margaritaceus. 69. T. ſubovate, with ſmooth, elevated, dorſal lines. Indian ocean.

verſicolor. 70. T. glabrous; finely ſtriated tranſverſely, and varied with green and white. South ſea.

71. T. umbilicus rough; whirls, with branched ſpines. India. *delphinus.*

72. T. depreſſed, knotty; an unequally tuberculated ridge on the back of the firſt whirl. *nodulοſus.*

73. T. ſubmucronate; covered with ſmooth ſpines. *diſtortus.*

74. T. baſe convex; whirls radiated with ſpines; 12 larger ones on the firſt; ſmall. South ſea. *ſtellaris.*

75. T. whirls crowned with laciniated ſpines; the firſt with 9 large ones. Nicobar iſlands. *aculeatus.*

76. T. baſe flattened; whirls ſpinulous at the lower margin. *ſtellatus.*

77. T. whirls convex, and ſeparated by a band, teſſelated with brown and white; colour of a medlar. South ſea. *meſpilus.*

78. T. ſurrounded with knotty rings; dirty green, with a reddiſh tip. Indian and South ſeas. *granulatu*

79. T. ſpire annulated; firſt whirl very large; perforation ſpoon-ſhaped. South ſea. *ludus.*

80. T. black, with double, alternate, black, and cinereous moniliform belts of granulations; pillar 1-toothed; ſize of a nut. Nicobar iſlands. *citratus.*

81. T. depreſſed, orbicular; white varied with brown; lower margin of the pillar denticulated. *dentatus.*

82. T. dirty green varied with brown; whirls 4, firſt large. New Zealand. A large ſhell. *diadema.*

83. T. ſmooth, roundiſh, cinereous; whirls ſubſtriated, ventricoſe, flattened at the future. *cinereus.*

84. T. thin, diaphanous, white, round; 6 keel-ſhaped whirls in the ſpire; perforations ſpiral. *carinatus.*

85. T. thin, ſmooth; whirls flattened; 2 lines long. Senegal. *afer.*

86. T. depreſſed, ſmooth, opaque, brown; whirls 4; 1½ line in diameter. *planorbis.*

87. T. hyaline, ſmooth, ſubcarinated; whirls 6, rounded; lip fringed, reflected. *marginellus.*

88. T. whirls rounded; perforation deep, wide, and funnel-ſhaped. *helicoides.*

89. T. pyramidal, with foliaceous wrinkles; perforation large. *foliaceus.*

90. T. tranſverſely ſtriated; within margaritaceous. *anguis.*

91. T. granulated, ſlightly umbilicated; within margaritaceous. New Caledonia. *porphyrites.*

92. T. white, glabrous, ſtriated green. New Zealand. *ſmaragdu*

D. *Cancellated.*

93. T. navel flattiſh, ſpreading; whirls round, with crenated ſtriæ. *crinellus.*

94. T. umbilicated, ſomewhat oblong and obtuſe; whirls round, ſmooth; 4 whirls. Minute. Freſh water near the baths in Tuſcany. *thermalus*

95. T. *wentle-trap;* conic; whirls diſtant, longitudinally ribbed. Var. 1. perforated with 8 whirls. 2. Imperforated with 10 whirls; 2 inches long. Barbary, Coromandel.—The wentle-trap is a very rare ſhell, and therefore greatly eſteemed among collectors. As a proof of this, in the year 1753, four ſpecimens which were diſpoſed of at the ſale of Commodore Liſle's ſhells in London, brought 75l. 12s. Two were ſold at 16 guineas each; one at 18 guineas, and the fourth at 23l. 2s. *ſcalaris.*

* 96. T. *falſe wentle-trap*; taper, not umbilicated; ſpire with longitudinal ribs; whirls ſmooth, ventricoſe, and ſeparated by a deep canal; from 1 to inches long. *clathrus.*

long. Indian and European ſeas, Britain, Falmouth, South Devon.

tuberculatus. * 97. T. duſky, with 12 finely tuberculated whirls. Northumberland coaſt.

ambiguus. . 98. T. tapering, perforated; whirls contiguous; ſmooth, ribbed. Mediterranean.

crenatus. 99. T. taper, ſubcancellated; whirls 8-ribbed, contiguous; crenated above.

lacteus. 100. T. taper; ſtriæ crowded, longitudinal, raiſed; ſize of a barley-corn. Mediterranean.

ſtriatulus. 101. T. ſubcancellated, taper; whirls contiguous; belts interrupted, varicoſe; ſize of a barley-corn. Mediterranean.

uva. 102. T. ovate, obtuſe; whirls contiguous, imbricated, and longitudinally ſtriated, $1\frac{1}{2}$ inch long. South America.

corneus. 103. T. umbilicated, rounded, rather acute; whirls round, with decuſſated ſtriæ; aperture reflected.

lincina. 104. T. oblong, obtuſe, with wrinkled ſtriæ; aperture with a dilated, flat, crenated border; 8 lines long. Jamaica.

linulatus. 105. T. white, cylindrical, reticulated; aperture remote.

labio. 106. T. oblong, umbilicated, brown, ſtriated with convex dots; lip white, dilated; 15 lines long. Jamaica.

triatus. * 107. T. ovate, imperforated, ventricoſe; finely ſtriated ſpirally; 6 lines long. Woods of Europe, Britain.

eflexus. 108. T. umbilicated, convex, a little prominent; whirls round, ſubſtriated; aperture reflected. Southern Europe.

ubius. 109. T. umbilicated, oblong; whirls equal; ſtriæ decuſſated; aperture dilated.

imbatus. 110. T. ſubovate, wrinkled, perforated. Coromandel.

E. *Tapering.*

mbricatus 111. T. whirls of the ſpire imbricated downwards; 4 inches long. American iſlands.

eplicatus. 112. T. ſmooth; whirls imbricated upwards; 3 inches long. Tranquebar.

cutangu-us. 113. T. with a ſingle prominent, acute, tranſverſe rib; 4 inches long. Tranquebar.

uplicatus. * 114. T. whirls with 2 prominent, acute, tranſverſe ribs; 5 inches long. Coromandel, ſhores of Britain.

xoletus. * 115. T. whirls with 2 prominent, obtuſe, diſtant, tranſverſe ribs; 2 inches long. Europe, Guinea, ſhores of Britain.

erebra. * 116. T. whirls 6, prominent, acutely ſtriated; from 2 to 6 inches long. Shores of Europe, Africa and China; Britain.

ævis. * 117. T. with 8 ſmooth whirls nearly obſolete. Minute. Shores of Angleſea.

lbus. 118. T. white, with 8 whirls tranſverſely ſtriated.

ariegatus 119. T. whirls of the ſpire flattiſh, with 7 obtuſe ſtriæ; 2 to 3 inches long. South America, Barbary.

ngulinus. 120. T. whirls of the ſpire with 10 obſolete ſtriæ; 2 to $4\frac{1}{2}$ inches long. European, Mediterranean ſeas.

bryſtalli-us. 121. T. whirls of the ſpire ribbed; aperture ovate. Denmark.

llbulus. 122. T. imperforated, glabrous; whirls rounded, ſtriated. Depths of the Greenland ſeas.

nnulatus. 123. T. whirls with a prominent, margined future; $1\frac{1}{4}$ inch long.

* 124. T. pellucid; whirls contrary; futures ſubcrenated; aperture 2-toothed behind; $1\frac{1}{2}$ inch long. Europe; roots of trees, Britain. *bidens.*

* 125. T. pellucid; whirls reverſed, not crenated; aperture 3-toothed, $\frac{1}{2}$ inch long. Europe, Britain, among moſs, and in old walls. *perverſus.*

126. T. obtuſe; grooves curved; whirls 11; $7\frac{1}{2}$ lines long. *fuſulus.*

127. T. obtuſe; groove ſtraight; whirls 9; aperture toothed. *fuſus.*

128. T. obtuſe, white; grooves oblique; aperture nearly ſquare; whirls 8; 12 lines long. *ſulcatus.*

129. T. whirls 9, recurved; aperture 4-toothed; 5 lines long. Bombay, Italy. *quadridens*

130. T. whitiſh; whirls 7; aperture 3-toothed; 5 lines long. Italy. *tridens.*

* 131. T. ovate, obtuſe, pellucid; 4 to 6 whirls; aperture toothleſs, oval; 1 line long. Among moſs, Britain. *muſcorum.*

* 132. T. deep brown, ſpires 4; firſt ventricoſe; aperture oval; ſize of a grain of wheat. Britain. *ulvæ.*

* 133. T. imperforated, ſmooth; whirls 5, nearly obſolete; tranſverſely barred. Minute. Pembrokeſhire coaſt. *trifaſciatus*

* 134. T. ſmooth; whirls 5, obliquely barred; aperture ſuboval. Minute. Pembrokeſhire coaſt. *membranaceus.*

* 135. T. whirls 5, ſubobtuſe, roundiſh; minute. Pembrokeſhire coaſt. *interruptus.*

* 136. T. ſmooth; whirls 5, ſomewhat angular above. Pembrokeſhire coaſt. *ſubrufus.*

* 137. T. whirls 3; the firſt with 3 tranſverſe ridges; minute. Seaſalter, England. *ſtrigatus.*

* 138. T. whirls 7, ridged; aperture oval. Seaſalter. Rare. *albidus.*

* 139. T. carinated; whirls 7; aperture contracted, margined. Sandwich. Rare. *carinatulus.*

* 140. T. whirls 6; aperture oval, margined; minute. Sandwich. Very rare. *clathratulus.*

* 141. T. thick, barred; whirls 5; aperture round, margined; minute. Sandwich. Rare. *craſſus.*

* 142. T. nine whirls, dotted, reverſed; aperture contracted; minute. Sandwich. *punctatus.*

* 143. T. whirls 6, reticulated; aperture oval, ſubmargined; minute. Sheppey iſland. *ſheppeianus.*

* 144. T. whirls 3, elegantly reticulated; aperture oval, toothed; minute. Sandwich. *ſandvicenſis.*

145. T. whirls 5, diſtinct, tranſverſely ſtriated, barred with white. *obtuſus.*

146. T. white, ſmooth; aperture with a flattiſh, concave, obtuſe, reflected lip. Mediterranean. *auriſcalpium.*

147. T. imperforated, glabrous; aperture oval; ſize of a barley corn. Mediterranean. *politus.*

148. T. flattiſh; whirls annulated, and erected on the back; minute. In ſtagnate waters in Europe. *dactylius.*

149. T. two obtuſe, approximate ridges on the whirls of the ſpire. *obſoletus.*

150. T. ſubumbilicated, whitiſh; whirls 12; aperture 5-toothed. *quinquedentatus.*

151. T. pyramidal, ventricoſe, horny, pellucid; aperture compreſſed; above one-fourth of an inch long. Germany. *pyramidalis.*

* 152. T. conic, ſmooth, gloſſy; whirls 5 or 6; aperture ſuboval; pillar furniſhed near the middle with 1 tooth; two-tenths of an inch long. Salcomb bay. *unidentatus.*

Gen,

Helix. 57

Gen. 29. Helix, *Snail.*

Gen. Char.—The animal a limax; ſhell univalve, ſpiral, ſubdiaphanous, brittle; aperture contracted, ſemilunar, or roundiſh.

Species.

A. *Whirls with a keel-ſhaped acute margin.*

ſcarabæus. 1. H. ovate, both edges keel-ſhaped; aperture toothed. Mountains of Aſia, and the Friendly iſlands.

lapicida. * 2. H. umbilicated; convex on each ſide; aperture tranſverſe, margined, ovate; ½ inch in diameter. Rocks, woods, and hedges in Europe, Britain.

marginata. 3. H. ſubumbilicated, a little depreſſed; obliquely ſtriated; aperture tranſverſe; 9 lines in diameter.

cicatricoſa. 4. H. umbilicated, depreſſed and wrinked; whirls reverſed.

ægophthalmos. 5. H. umbilicated, depreſſed, greeniſh, immaculate; whirls 7; an inch acroſs. India, South America.

oculus capri. 6. H. ſubcarinated, umbilicated, convex; aperture margined. Trees in Aſia.

albula. * 7. H. umbilicated, flattiſh; gibbous beneath; aperture ſomewhat heart-ſhaped. Europe, Britain, rocks and dry banks.

maculata. 8. H. perforated, flattiſh, ſubcarinated; white, dotted with brown; gibbous beneath, with linear bands; 5 lines acroſs.

albina. 9. H. perforated, flattiſh, white, gibbous beneath; aperture quadrangular.

ſtriatula. 10. H. ſubcarinated, umbilicated, convex, ſtriated; more gibbous beneath; aperture roundiſh, lunated; minute. Water-falls of Lombardy.

algira. 11. H. ſubangular, umbilicated, convex; whirls 6; navel pervious.

leucas. 12. H. ſubcarinated, umbilicated, convex, ſmooth; beneath gibbous; navel very minute; aperture roundiſh, lunate.

lævipes. 13. H. perforated, ſubcarinated, contrary, convex, pale with a rufous band, united to a white one; ¼ inch in diameter.

exilis. 14 H. perforated, depreſſed, ſubcarinated; pale with a rufous band joined to a white one; whirls ſtriated; 10 lines acroſs. Tranquebar.

vermiculata. 15. H. ſubglobular, depreſſed, rough, imperforated; dotted with white; lip reflected, white. Italy and Portugal.

candida. 16. H. umbilicated, convex on each ſide; aperture not margined.

ſpadicea. 17. H. perforated, umbilicated, cheſnut; whirls 5; 7 lines high.

incarnata. 18. H. perforated, ſubglobular, ſubcarinated; whirls 6; lip fleſh-coloured; 6 lines broad. Woods of Denmark and Germany.

ſericea. 19. H. perforated, ſubglobular, convex on each ſide; tomentoſe. Denmark, in gardens.

coronulata. 20. H. perforated, globular, ſubcarinated and ſtriated; white, with a brown band; 3½ lines wide. Lyons.

planorbis. * 21. H ſubcarinated, umbilicated, flat; above concave; aperture oblique; ovate and acute on each ſide. Ponds and rivers of Europe and Barbary, Britain.

complanata. 22. H. carinated downwards, umbilicated, convex; flat beneath; aperture ſemi-heart-ſhaped. Ponds and rivers of Europe.

23. H. ſubcarinated, imperforated, convex, with an inverted, ringent aperture; lip 4-plaited behind; 1½ inch wide. India. *ringens.*

24. H. imperforated, ſubcarinated, reddiſh brown, with a white ridge; aperture tranſverſe; toothed and 3-plaited behind; 9 lines in diameter. America. *ſinuata.*

25. H. imperforated, white; flattiſh above; beneath gibbous; aperture tranſverſe, 2-toothed; 13 lines broad. *lucerna.*

26. H. imperforated, flattiſh above, beneath gibbous; whirls ſcared. A rare ſhell. *lampas.*

27. H. imperforated, a little convex on each ſide, with a white tranſverſe lip. India. *carocolla.*

28. H. imperforated, top-ſhaped, white, with fulvous bands; aperture tranſverſe, 2-toothed. *lychnuchu*

29. H. ſubglobular, umbilicated, ſubcarinated; yellowiſh, with a whitiſh band; aperture tranſverſe, 2-toothed, and ſinuated behind. *cepa.*

30. H. ſubcarinated, imperforated, convex; aperture with a white margin. India. *cornu-militare.*

31. H. ſubcarinated, with flame-coloured, red, and white bands; beneath ſurrounded with 4 rows of dots; aperture fringed. Warm parts of America. *pellis-ſerpentis.*

* 32 H. flat, thin, concave above; aperture oval, flat; 3 lines wide. Ponds and rivers of Europe, Britain. *vortex.*

33. H. ſubcarinated, imperforated, ovate, pointed and ſtriated. *ſcabra.*

34. H. convex on each ſide; horny, with ſubferruginous bands. Woods of Sweden. *gothica.*

35. H. imperforated, depreſſed, with decuſſated ſtriæ; aperture acute on each ſide. India. A land ſpecies, very rare. *gualteriana.*

36. H. top-ſhaped, acuminated, with convex ſpiral ſtriæ, and triple ridge; aperture dilated; 11 lines wide. *tricarinata.*

37. H. browniſh, depreſſed; firſt whirl round; aperture contracted; nearly triangular; 3-toothed and margined. Virginia and Alſace. *iſogonomoſtamus.*

38. H. depreſſed, umbilicated; whirls contiguous; the firſt large; aperture oblong, ovate. *oculus communis.*

39. H. umbilicated, convex on each ſide; variegated with white and cheſnut; aperture winged and ſlightly margined. *affinis.*

40. H. umbilicated, obliquely ſtriated; convex above, beneath a little depreſſed; firſt whirl carinated; 1½ inch broad. *marginell*

41. H. ſubcarinated, imperforated; convex on each ſide, with hollow dots; aperture tranſverſe; 7-toothed; whirls 6. *ſinuoſa.*

42. H. umbilicated, ſubcarinated, obliquely ſtriated and a little depreſſed; aperture lunated, with a margined lip. *maculoſa.*

43. H. ſubumbilicated, ſubcarinated; aperture tranſverſe, oblong; lip margined, 3-toothed. *punctata.*

44. H. ovate, glabrous; whirls 5; the firſt gibbous, the reſt carinated; aperture oblong-ovate; 2 inches high. *vitrea.*

45. H. umbilicated, depreſſed, white; whirls 4, the firſt gibbous and doubly carinated; aperture ovate; 2 lines in diameter. *annulata.*

46. H. umbilicated, white, depreſſed above; whirls *rhenana.*

carinated and irregularly ſtriated, the laſt brown. Rhine.

nævia. 47. H. depreſſed, umbilicated; white, with longitudinal black ſpots above, and 5 bands beneath. Santa Cruz.

corrugata. 48. H. umbilicated, wrinkled, and obliquely ſtriated; aperture lunated. Jamaica.

faba. 49. H. imperforated, ſmooth, ſaffron with brown margin, and baſe of the whirls; aperture blue. Otaheite.

crenata. 50. H. rounded, brown; whirls carinated; aperture ſinuous. New Zealand.

carinata. * 51. H. ſtriated, carinated; whirls 3; aperture ſuboval; minute. Freſh water near Faverſham, England.

B. *Umbilicated; whirls rounded.*

cornea. * 52. H. above umbilicated, flat, blackiſh; whirls 4. Freſh waters, Europe, Coromandel, Britain.

ſpirorbis. 53. H. concave on each ſide, flat, whitiſh; whirls 5, rounded; 1½ line diameter. Stagnant waters, France, Germany.

polygyra. 54. H. flattiſh, orbicular; aperture oval; lip fringed.

contorta. 55. H ſubumbilicated, flat on each ſide, equal; aperture linear, arched; 1 to 2 lines wide. Stagnant waters of Europe.

nitida. 56. H. poliſhed, yellowiſh, above convex, umbilicated; flat beneath, perforated; 1 to 3 lines in diameter. Ditches of Denmark.

alba. 57. H. white, umbilicated on each ſide; aperture dilated; 1 to 2 lines wide. Denmark, aquatic plants.

ſimilis. 58. H. pellucid, umbilicated above; ſtriated with dots. Ditches in Denmark and Berlin.

cornu-arietis. 59. H. umbilicated, flattiſh; aperture oval; 12 to 16 lines in diameter. China.

hiſpida. * 60. H. umbilicated, convex, hiſpid, diaphanous; whirls 5; aperture roundiſh, lunated. Woods of Europe. Britain.

ampullacea. 61. H. ſubumbilicated, ſubglobular, glabrous; whirls above more ventricoſe; aperture large, ovate, oblong; 1 to 5 inches wide. Aſia and America.

piſcinalis. 62. H. globular, perforated, reddiſh brown; whirls four. Fiſh ponds of Denmark.

puſilla. 63. H. globular, perforated; aperture rolled ſpirally inwards. Lakes of Germany.

ſpherica. 64. H. globular, horny, with an obtuſe crown; 1 to 2 lines wide. Seas of Denmark.

pomatia. * 65. H. ſubumbilicated, ſubovate, obtuſe; aperture roundiſh, ſemilunar; reddiſh brown, with obſolete, paler bands. Woods of Europe, Britain.—This ſpecies was a favourite diſh among the Romans. It is ſtill uſed as an article of food in many parts of Europe, during the ſeaſon of Lent. It was introduced into England by Sir Kenelm Digby, as a cure for conſumption.

glauca. 66. H. umbilicated, roundiſh, pointed; lip margined; aperture oval.

citrina. 67. H. ſubumbilicated, convex, obtuſe; yellowiſh, with a brown band; from 12 to 18 lines wide. Woods of Jamaica and China.

caſtanea. 68. H. perforated, ſubglobular, dull cheſnut, with a rufous band united to a white one; whirls 7, ſtriated.

rapa. 69. H. perforated, ſubglobular, with hollow dots and a red band; firſt whirl larger; 8 lines wide.

globulus. 70. H. globular, ſubumbilicated, white; lip reflected; whirls 5.

lactea. 71. H. imperforated, depreſſed; gray, with white dots; aperture red brown. Jamaica and Portugal.

inciſa. 72. H. depreſſed, umbilicated, white, with a cut margin.

arbuſtorum. * 73. H. umbilicated, convex, pointed; aperture ſuborbicular, a little reflected at the rim, brown, with a ſingle black ſpiral band; 9½ lines wide. Shrubberies and hedges, Britain.

fulva. 74. H. nearly imperforated, globular, pellucid; fulvous, with a white lip; 1 to 3 lines wide. Woods of Denmark.

epiſtylum. 75. H. ſubimperforated, ſubglobular, ſtriated; whirls 7; 12 lines in diameter.

cincta. 76. H. ſubimperforated; white, with rufous lip and bands; whirls 5; 18 lines wide.

ligata. 77. H. ſubimperforated, ſubglobular; white, with rufous bands; whirls 4; 14 lines wide. Italy.

aſperſa. 78. H. ſubimperforated, ſubglobular; pale yellow, with 4 rufous bands, interrupted with white ſpots; whirls 4; 12 to 18 lines in diameter. Italy.

extenſa. 79. H. ſubimperforated, ſubglobular, pale, immaculate; aperture large; whirls 4, diſtant.

piſana. 80. H. perforated, globular; white, with ſubinterrupted red bands; lip roſy; 5 to 7½ lines wide. Barbary, Italy.

ſtrigata. 81. H. perforated, with a depreſſed crown; white, with rufous bands, and numerous lines; lip white on each ſide; 10 lines wide.

nemorenſis. 82. H. perforated, globular, poliſhed; white, with brown bands; 15 lines wide. India.

zonaria. * 83. H. umbilicated, convex, ſlightly depreſſed; aperture rather oblong and margined; whirls 5; firſt ventricoſe; 11 to 13 lines in diameter. Barbary, Europe, Britain.

ſtriata. 84. H. umbilicated; ſubdepreſſed, ſtriated, white; 6 lines wide. Italy.

ericetorum. * 85. H. umbilicated, depreſſed, yellowiſh, with a brown band or bands; 4 to 11 lines wide. Europe, Britain.

nitens. * 86. H. umbilicated, ſubdepreſſed, fulvous, horny, or yellowiſh green; ſubſtriated; aperture large; whirls 4 or 5; 1 to 4 lines wide. Wet woods of Europe, Britain.

coſtata. 87. H. umbilicated, cinereous; whirls 4; rib tranſverſely plaited; aperture circular; 1 line wide. Highlands of Denmark.

pulchella. 88. H. umbilicated, ſubdepreſſed; aperture circinate; lip white, reflected; whirls 4; 1 line wide. Moiſt woods of Denmark.

rotundata. 89. H. umbilicated, ſubdepreſſed, with elevated tranſverſe lines, and ferruginous ſpots; 2½ lines wide. Moiſt places, and rotten wood, in France, Germany, and Denmark. Common.

cellaria. 90. H. umbilicated, depreſſed; yellowiſh, poliſhed; white beneath; aperture large; whirls 5; 3½ lines wide. Cellars in Germany.

obvoluta. 91. H. umbilicated, depreſſed on both ſides; whirls obvoluted. Var. 1. Whitiſh, glabrous, with a triangular aperture. 2. Brown, hiſpid, with a linear aperture; 4 to 5 lines wide. Italy.

ſtrigoſula. 92. H. perforated, ſubdepreſſed, ſtriated; white, with a rufous band; 5 lines wide. France.

radiata. 93. H. perforated, ſtriated; convex beneath; radiated. France and Virginia.

cryſtallina. 94. H. perforated, depreſſed, gloſſy white, diaphanous; 4 to 5 whirls; 1 line wide. Denmark, among moſs.

ungulina. 95. H. umbilicated, convex; aperture margined, ſuborbicular, and elongated above; of the ſhape of an apple; 16 lines wide. India.

varica. 96. H. globular, umbilicated, whitiſh yellow; whirls 5, reverſed; the outermoſt divaricated; 19 lines wide.

fruticum. 97. H. umbilicated, globular; aperture without pillar lip; 7¼ lines wide. Hedges of Denmark.

lucena. 98. H. ſubglobular, umbilicated; gibbous beneath; lip reflected, white; whirls 5; the firſt very convex.

vittata. 99. H. ſubglobular, ſubumbilicated; white, with crowded cheſnut bands and blue crown; lip reflected, white; 9 lines in diameter. Coromandel.

roſacea. 100. H. ſubglobular, ſubumbilicated; fleſh colour, and tranſverſely ſtriated; whirls 5; 19 lines wide.

itala. 101. H. umbilicated, convex, obtuſe; whirls 5, round; navel wide; ſize of a nut. Southern Europe. A land ſpecies.

luſitanica. 102. H. umbilicated, perforated, convex, obtuſe; whirls 5, round, and yellowiſh white; umbilicus ſpreading; ſize of a ſmall apple. Southern Europe. A land ſpecies.

mammelaris. 103. H. umbilicated, ovate; whirls 3, ſtriated; aperture large, ovate, and united to the tip. Rivers of Africa.

hiſpana. 104. H. umbilicated, convex; whirls 5, round; umbilicus thin, perforated; aperture ſuborbicular. Southern Europe.

lutaria. 105. H. umbilicated, ovate, oblong; finely ſtriated; aperture white within.

ovalis. 106. H. perforated, ovate, ventricoſe, and ſtreaked; tip ribbed and roſy; lip of the ſame colour; pillar white; whirls 6; 4 inches long.

oblonga. 107. H. perforated, ovate, oblong, ſtriated; lip and pillar roſy; whirls 6; aperture oval; 3 inches long. South America and India.

flammea. 108. H. perforated, oblong; white, with longitudinal, rufous bands; pillar reflected, ſtraight; 18 to 20 lines long. Guinea.

pileus. 109. H. top-ſhaped, white with rufous bands; whirls 6; aperture tranſverſe, large; 15 lines long.

nuclcata. 110. H. top-ſhaped, umbilicated; convex on both ſides; brown, with prickly ribs; lip whitiſh; ¾ line wide. Woods of Denmark.

volvulus. 111. H. top-ſhaped, umbilicated, acuminated; aperture circinated; 11 to 22 lines wide.

involvulus. 112. H. top-ſhaped, umbilicated, pointed; white, with ſpiral, convex ſtriæ; aperture circinate; 13 lines wide.

neritina. 113. H. glabrous, hardiſh, umbilicated; cheſnut, with white bands; whirls flat beneath; aperture ovate, oblong; 1 inch long.

turturum. * 114. H. umbilicated, rounded, thin; aperture ſemilunar. Woods of Europe; Britain.

olivetorum. 115. H. umbilicated, a little depreſſed, yellow; aperture compreſſed; firſt whirl flattiſh, round. Olive groves, Florence.

badia. 116. H. umbilicated, ſubglobular, ſmooth; aperture linear; 1 inch high.

cretacea. 117. H. ſubumbilicated, ſmooth; whirls convex; aperture lunated; 10 lines high.

pileata. 118. H. ſubumbilicated, conic, white, with cheſnut bands; aperture ſemilunar; tip obtuſe.

fuſceſcens. 119. H. rounded, ſubumbilicated; thin; aperture ſemilunar. Thuringia.

terreſtris. 120. H. umbilicated, with an obtuſely mucronate ſpire; firſt whirl very large, the reſt gradually decreaſing; aperture margined, ſemilunar: whirls 6.

nivea. 121. H. rounded, umbilicated, thin, gloſſy white; aperture ſemilunar.

media. 122. H. flat on both ſides, umbilicated; whirls 6, the firſt round; aperture ſuborbicular. Germany.

tenella. 123. H. umbilicated, very thin, flat, poliſhed, and convex above; aperture compreſſed, ſemilunar; whirls 5, contiguous.

crepuſcularis. 124. H. umbilicated, depreſſed, white; whirls 6, round, 3d and 4th brown, the laſt reddiſh at the tip; aperture ſemilunar, ſmooth. Guinea.

hyalina. 125. H. umbilicated, pellucid; beneath hemiſpherical, white; whirls reverſed. Shores of Guinea.

avellana. 126. H. umbilicated, obtuſely ſubtriangular, rough, plaited and ſilvery within; aperture ſmooth, eared; firſt whirl with an elevated circle; ſize and colour of a nut; pillar lip white. Southern ocean.

rufeſcens. 127. H. inflated, ſubumbilicated, fragile; whirls 5; firſt very large; aperture ſemilunar; 6 lines wide. Rivers of Hamburgh.

pervia. 128. H. umbilicated, obtuſely ſubpyramidal; whirls 4, convex; the firſt with an elevated circle; the reſt ſurrounded with a groove; aperture ſemilunar; minute.

læviſſima. 129. H. umbilicated, oblong; whirls round and ſmooth; aperture orbicular.

faſcicularis. 130. H. umbilicated, pellucid; whirls 3, divided by a groove; aperture orbicular and not margined. The animal, beſides the two tentacula, is furniſhed with a creſt. Waters of Straſburg and Paris. Very rare.

holoſericea. 131. H. umbilicated, depreſſed; firſt whirl villous, flat; aperture triangular, margined; whirls 6; ½ inch wide. France and Switzerland.

turgida. 132. H. thin, fragile, white, umbilicated: firſt whirl round, inflated; whirls 6; ¾ inch wide. Waters of Hamburgh.

tenuis. 133. H. umbilicated, pellucid, horny, tranſverſely ſtriated, and convex; whirls 6, gradually decreaſing; aperture ſemilunar; 4 or 5 lines in diameter.

coriacea. 134. H. cartilaginous, horny, pale yellow, ſubpellucid, gibbous. Kurile iſlands.

cornu-venatorium. 135. H. depreſſed, deeply umbilicated. Leaves and branches of trees, Senegal.

elegans. 136. H. pyramidal, white, umbilicated; whirls 6, acute, flattiſh, and margined. Barbary and Southern Europe. A land ſnail.

cookiana. 137. H. pyramidal, ſmooth, white, obtuſe; baſe imperforated, convex. South ſea iſlands.

bidentata. 138. H. pyramidal, ſubcarinated, very finely ſtriated; lip reflected, 2-toothed. Botanic garden at Straſburg.

turbo. 139. H. pyramidal, ſubimperforated, varied with yellow and rufous. Coromandel.

trifaſciata. 140. H. conic, ovate, white, with 3 browniſh bands in the firſt whirl; aperture fringed; lip white, dilated. Tranquebar. A land ſpecies.

bontia. 141. H. conic, ventricoſe, perforated, pellucid, with a black tip; firſt whirl with 3 yellowiſh bands. Bengal.

trochoides. 142. H. top-ſhaped, perforated, poliſhed; longitudinally ſtriated; whirls reverſed, the firſt keel-ſhaped; aperture angular.

tomentoſa. * 143. H. umbilicated; whirls 3, briſtly; aperture roundiſh; minute. Boggy ground, Pembrokeſhire.

tubulata. * 144. H. whirls 3, longitudinally ſtriated; tube at the baſe margined; minute. Coaſt of Pembrokeſhire.

faſciata. * 145. H. ſubumbilicated, ſmooth; whirls 3, firſt more ventricoſe; aperture dilated; minute. Sandwich and Tenbigh.

nitidiſſima. * 146. H. umbilicated; whirls 2, tranſverſely ſtriated; minute. Pembrokeſhire coaſt.

bicolor. * 147. H. ſlightly umbilicated, ſmooth; whirls 2; minute. Pembrokeſhire coaſt.

ſpinoſa. * 148. H. ſubglobular, umbilicated; mouth roundiſh; margin thorny; minute. Near Feverſham. Rare.

reticulata. * 149. H. ſubumbilicated, reticulated; mouth rounded, margined; minute. Reculver. Very rare.

C. *Rounded and imperforated.*

perverſa. 150. H. ſubumbilicated, ovate, oblong; whirls 5 to 8, contrary; 18 to 28 lines long. India.

dextra. 151. H. conic, yellow; lip reflected, white; whirls 6 to 7; aperture ovate; 18 to 22 lines long.

recta. 152. H. conic, a little pointed; whitiſh with a rufous band and ſtreaks; lip reflected; whirls 7; 2½ inches long.

inverſa. 153. H. conic, pointed; whirls 8. obliquely ſtreaked, contrary; 2½ inches long. Mauritius and Bourbon iſlands.

interrupta. 154. H. conic, pointed, white with fulvous ſtreaks; lip white, reflected; whirls 7; 22 lines long.

contraria. 155. H. conic, pointed; whirls contrary; white, with undulated, interrupted, brown ſtreaks; 15 lines long; very rare.

læva. 156. H. ſubcylindrical, glabrous, contrary, barred; pillar yellow; lip ſlightly reflected; 12 to 16 lines long; very rare.

arenaria. 157. H. gloſſy, whitiſh, thin, longitudinally ſtriated; ſpire contrary, hemiſpherical; minute. Armenian coaſt.

jamaicenſis. 158. H. globular, cheſnut-brown, barred with white; lip fringed, white; crown obtuſe. Jamaica.

rhodia. 159. H. ſubglobular, depreſſed; baſe concave; aperture lunated. Rhode iſland.

labioſa. 160. H. oblong, poliſhed, white, diaphanous; whirls 8; aperture ovate, toothleſs; 11 lines long. India.

pudica. 161. H. oblong, a little wrinkled, roſy; whirls 6; aperture toothleſs; 20 lines long.

ianthina. 262. H. nearly imperforated, roundiſh, obtuſe, diaphanous and very brittle; aperture dilated behind, with an emarginated lip; 1 inch broad and high. In moſt ſeas.—The animal which inhabits this ſhell ſhines in the night, and ſtains the hand with a violet or purple dye.

gigantea. 163. H. imperforated, roundiſh, ſolid, with a depreſſed ſpire; whirls 6, contiguous.

vivipara. * 164. H. imperforated, ventricoſe, ſubovate, obtuſe; whirls 5 to 6, very convex; aperture nearly orbicular; 1½ inches long. Stagnant waters of Europe, Britain. This ſpecies is viviparous.

faſciata. 165. H. ovate, ventricoſe; white with 3 ſhining red bands; whirls 5; ſpire acute; 9 to 15 lines long. Italy.

diſſimilis. 166. H. ſubovate, pointed, yellowiſh-white, with a black lip; whirls 6. Tranquebar.

nemoralis. * 167. H. perforated, roundiſh, thin, pellucid, and marked with variouſly coloured tranſverſe bands; whirls 5, from 9 to 11 lines wide. Woods of Europe, Britain.

hortenſis. * 168. H. *Garden Snail;* imperforated, globular, pale, with broad, interrupted, brown bands; lip white; 7 to 8 lines wide. Gardens and orchards, Europe, Britain.—This ſpecies is extremely deſtructive to the tender leaves of plants, and fruits. It is oviparous; the eggs are round, and about the ſize of ſmall peas.

lucorum. 169. H. imperforated roundiſh, ſmooth; whitiſh, with rufous ſtreaks and bands. Southern parts of Europe.

griſea. 170. H. imperforated, ſubovate, obtuſe, gray with two pale bands; aperture rather oblong. Woods of Europe.

hæmaſtoma. 171. H. imperforated, roundiſh, brown, with a longitudinal white band; whirls 5, round, firſt large; aperture pure purple; 1½ inch broad. Ceylon.

pulla. 172. H. imperforated, ſubovate, brown ſtriped; whirls 4; aperture oblique, margined, whitiſh; 2 inches broad.

venuſta. 173. H. imperforated, ſubovate; ſulphur with a white band margined with red; whirls 4; lip reflected, margined; 10 lines broad.

picta. 174. H. imperforated, ſubglobular, glabrous; whirls 4, round, firſt ventricoſe, the others depreſſed; aperture lunar. Italy.

variegata. 175. H. imperforated, ſubovate, covered with a brown cuticle, under which it is barred; aperture white within. Italy.

ſolida. 176. H. imperforated, ſolid, ovate; whirls 6, round, contiguous; pillar thickened; 1 inch long.

aperta. 177. H. imperforated, ſubglobular, finely ſtriated longitudinally; whirls 3, firſt ventricoſe; aperture lunar; pillar ſpiral.

verſicolor. 178. H. imperforated, roundiſh, and tranſverſely ſtriated; whirls round, the firſt ventricoſe; aperture ovate.

afra. 179. H. imperforated, ovate; whirls 6, flattiſh, contiguous; aperture unequal, 5-toothed; 3 lines long. Senegal.

nucleus. 180. H. imperforated, ovate, tranſverſely ſtriated with black belts: aperture ſinuous. Otaheite.

coccinea. 181. H. imperforated, ovate, ſmooth, red; aperture pale yellow. New Zealand.

variegata. * 182. H. imperforated, ſubpellucid, ſmooth, with red lines; whirls 4, the firſt more ventricoſe; minute. Welch coaſt.

fulgida. * 183. H. whirls 3; aperture rounded, margined; minute. Welch coaſt.

ſtriata. * 184. H. ſtriated; aperture ſuboval; whirls reflected on the back; minute. Sandwich. Very rare.

D. *Tapering.*

decollata. * 185. H. imperforated, tapering; ſpire mutilated, truncated; whirls 4 to 7, firſt large; 6 to 15 lines long. Europe, Aſia, and Africa; Britain.

ſcalaris. 186. H. conic, tapering, imperforated; whirls 5, ventricoſe, remote; ſpire obtuſe; aperture ovate.

circinata. 187. H. hyaline, tranſverſely ribbed, perforated, and a little tapering; whirls diſtant; aperture circular; 6 lines high.

ſubcylindrica. 188. H. imperforated, tapering, ſubcylindrical, obtuſe; whirls 4; aperture ovate; ſize of a grain of rye. Freſh waters, north of Europe.

ſtagnorum. 189. H. ſubperforated, and a little tapering; whirls 5; aperture ovate; minute. Freſh waters.

octona. * 190. H. ſubperforated, tapering; whirls 8; aperture roundiſh; 4 lines long. America, Europe, Britain.

tenera. 191. H. tapering, convex, ſtriated; pillar ſinuated, inflected; whirls 7 to 8, with incumbent margins; aperture ovate, oblong; 2½ inches long.

columna. 192. H. tapering, white, with a fulvous tip; whirls 7 or 8, contrary, ſpotted; aperture oblong; 27½ lines long.

pella. 193. H. imperforated, ovate, pointed, tranſverſely ſtriated; brown, with yellow bands; band on the firſt whirl double, on the reſt ſingle. Iceland.

plicaria. 194. H. ſubulate, ſemipellucid, longitudinally plaited; whirls 10, round; aperture ovate.

undulata. 195. H. ſubulate, ſmooth, finely ſtriated tranſverſely; whirls about 12, round; aperture ovate; pillar glabrous.

fuſcata. 196. H. ſubulate, ſmooth, finely ſtriated tranſverſely; whirls about 10, round; aperture ovate; pillar ſmooth.

priapus. 197. H. imperforated, tapering, glabrous; pillar ſomewhat depreſſed; pillar inflected.

folliculus. 198. H. tapering, pellucid, glabrous; whirls 5 or 6, round, equal; aperture ovate; pillar ſlightly plaited; ſize of an oat. Barbary.

ſepium. 199. H. tapering, milk-white, longitudinally ſtriated; whirls 7, contiguous; aperture ovate; ½ inch long. Mountains of Southern Europe.

ſplendidula. 200. H. thin, gloſſy, pellucid; whirls 6; aperture oblong; ½ inch long. France.

mitra. 201. H. ſhell tapering; whirls 8 or 9, diſtant ribbed; firſt round, the reſt flattiſh; aperture ovate; 1 inch long.

atra. 202. H. black, tapering, minutely ſtriated; whirls 7, rather convex; aperture oblong, oval; 2 inches long.

cuſpidata. 203. H. tapering, horny, finely ſtriated tranſverſely, and longitudinally plaited; lip acute. Rivers of India.

crenata. 204. H. tapering, white, tranſverſely ſubſtriated, and ſurrounded with a crenulated belt near the future. Rivers of India.

carinula. 205. H. white, tapering, ſomewhat umbilicated; firſt whirl a little keel-ſhaped, with a blackiſh band.

crocea. 206. H. cylindrical, glabrous, yellowiſh orange; tip obtuſe.

lanſchaurica. 207. H. tapering, very glabrous, cheſnut-brown with darker ſpots; throat whitiſh. Freſh waters, Coromandel.

obtuſata. 208. H. white, denſely ſtriated, ſubcylindrical; whirls a little convex; lip margined; 3 inches long.

purpurea. 209. H. ovate, oblong, purpliſh, teſſelated with purple; within irideſcent. New Zealand.

E. *Ovate, imperforated.*

pupa. 210. H. coarſe, nearly imperforated, ovate, oblong; whirls 6; aperture oblong, lunated. Mauritania.

barbara. 211. H. coarſe, oblong, imperforated; whirls 8; aperture roundiſh, lunated; ſize of a barley-corn. Algiers.

amarula. 212. H. oblong, imperforated; whirls toothed, ſpinous; 10 lines long. Rivers of India.

nævia. * 213. H. tranſverſely grooved; white, ſtriated with black; whirls flattiſh, the firſt large and round; ſpire pointed; an inch long. Southern ocean, Plymouth dock.

aſpera. 214. H. pointed, cinereous, tranſverſely ſtriated; whirls 7 to 8, toothed, marked with red ſtreaks, and armed with ſharp ſpines; 5 to 8 lines long. Coromandel.

ſtagnalis. * 215. H. imperforated, ovate, tapering to a point; ſomewhat angular, by ſeveral longitudinal wrinkles; whirls 6 to 7, firſt ventricoſe; aperture oblong, oval; 2½ inches long. Still waters of Europe, Britain.

fragilis. * 216. H. imperforated, ovate, tapering to a point; ſpire acute; whirls 5 to 7; aperture oblong, oval; 11 lines long. Still waters of Europe, Britain.

glabra. 217. H. cylindrical, pointed, horny; aperture ovate; whirls 8; four lines long. Moiſt meadows of Denmark.

paluſtris. * 218. H. oblong, pointed, brown; aperture ovate; whirls 5 to 6. Meadows of Europe, Britain.

truncatula. 219. H. ovate, oblong; whirls 5, truncated upwards; aperture ovate; 2 to 5 lines long. Greece.

peregra. * 220. H. ſubconic, horny, with a ſharp point; aperture ovate; 2 to 8 lines long. Stagnant waters of Denmark, Britain.

glutinoſa. * 221. H. ventricoſe, diaphanous, with an obtuſe projection; 2 to 3 whirls; aperture wide; 2 to 4 lines long. Denmark, chiefly on the leaves of nymphæa lutea. Marſhes at Deal.

putris. * 222. H. imperforated, obtuſe, ovate, yellow; whirls 3, the firſt large, the others minute; aperture ovate; 1 to 8 lines long. Ponds in Europe, Britain.

acuta. 223. H. conic, pointed, white, with a red band; whirls 7; aperture ovate, toothleſs; 4 lines long. Italy.

papilla. 224. H. conic, perforated; ſtriæ rugged; aperture tranſverſe; whirls 6; 10 lines wide.

minuta. 225. H. ſubcylindrical; whirls 5; aperture toothleſs, oval. Greece. Not a line long.

detrita. * 226. H. conic, white, with tranſverſe rufous lines; whirls 6; aperture ovate; 8½ lines long. Saxony, Britain.

ventricoſa. 227. H. conic, pale, ſtriated; whirls 7; the 4 outermoſt nearly of equal width; 8½ lines long. Greece.

obſcura. * 228. H. conic, brown; whirls 6; aperture oval, toothleſs; ſnail white; above duſky, eyes only black. Roots of trees, Europe, Britain.

lubrica. * 229. H. conic, fulvous, poliſhed; whirls 5 or 6; aperture toothleſs; 2½ lines long. Moſs and wet rotten wood, Britain.

limoſa. * 230. H. imperforated, ſomewhat oblong, pellucid; aperture ovate. Wet meadows of Europe, Sandwich, river Avon.

contortuplicata. 231. H. turbinated, cinereous, nearly imperforated; crown truncated; whirls 5; aperture circinated.

232. H.

ungularis. 232. H. imperforated, greeniſh; whirls 5, ſpirally angular; throat white; 12 lines long. China.

tentaculata. * 233. H. imperforated, ovate, obtuſe, clouded with brown; whirls 4 or 5; aperture ſubovate; 1—4 lines long. Ponds and ſtill waters of Europe, Britain.

auricularia. * 234. H. imperforated, ovate, gibbous, with a depreſſion in the middle of the lip; whirls 3—5; the firſt ventricoſe; ſpire acute, ſhort; aperture much dilated; 2—15 lines long. Ponds of Europe, Britain.

lævigata. * 235. H. whirls 2; firſt ventricoſe; the other minute, and placed laterally; pale red, pellucid. Europe, Devonſhire.

balthica. 236. H. imperforated, ovate, pointed; whirls 4; wrinkles elevated; aperture ovate, dilated. Shores of the Baltic.

neritoidea. 237. H. imperforated, convex, longitudinally ſtriated; aperture roundiſh.

perſpicua. 238. H. imperforated, convex, ovate; without lip; aperture extending to the tip. Mediterranean.

haliotoidea 239. H. imperforated, depreſſed, with waved ſtriæ; aperture oval; open all the way down; whirls 4, lateral. Mediterranean, Atlantic, Indian and North ſeas.

muralis. 240. H. imperforated, ſubdepreſſed, white; whirls 6; 6 lines wide. France.

vertigo. 241. H. cylindrical, glabrous; whirls 4 or 5; round, reverſed; aperture ſquare, 6-toothed; 1 line long. In decayed wood, Denmark.

carychium. 242. H. hyaline, ſubconic, glabrous; whirls 5, round; aperture ovate, with 3 teeth within.

ambigua. 243. H. ſubimperforated, convex; grooves remote, compreſſed; aperture ſemiorbicular. Mediterranean ſea.

corneus. 244. H. imperforated, ovate, black; aperture ovate. Waters of Greece.

pyrum. 245. H. ſubcylindrical, with decuſſated ſtriæ; whirls 7, reverſed; 3 very large, depreſſed in the middle. Guinea.

marmorata. 246. H. marbled with white, cinereous and blue; whirls 5, round; aperture ovate, $\frac{1}{4}$ inch long. Rivers of Straſburg.

achatina. 247. H. cheſnut, pellucid, thin; whirls 4, narrow; aperture ovate.

lugubris. 248. H. ovate, pointed, pellucid, tranſverſely ſtriated; whirls 7, firſt largeſt; aperture oblong, ovate; 9 lines long.

minima. 249. H. ovate, conic, ſubimperforated; 2 laſt whirls in the centre of the firſt; aperture orbicular; $1\frac{1}{2}$ line long.

inflata. 250. H. white, ſolid, opaque; firſt whirl twice as large as the reſt; aperture large, margined. River Unſtrut.

albicans. 251. H. white, opaque, pointed; aperture oval. Waters of Hamburg.

repanda. 252. H. ovate, pointed, ſubimperforated; firſt whirl ventricoſe, large; aperture ſemicircular; 6 or 7 lines long. Stagnant waters.

opaca. 253. H. ovate, pointed; whirls 5; firſt large; aperture ovate, oblong. Aquatic.

turgida. 254. H. obtuſe; whirls 4, diſtant, inflated in the middle; aperture orbicular, margined; 2 lines long.

cæruleſcens. 255. H. bluiſh, ovate, pointed; whirls 4, a little ventricoſe; aperture oblong, rounded; 2 lines long.

cinerea. 256. H. inflated; whirls 4, ſhort; two lower ones diſtant; aperture orbicular, not margined; 2 lines long. Alſace.

undata. 257. H. imperforated, oblong, white with longitudinal red undulations; whirls 6—7, firſt thrice as large as the next; $1\frac{1}{4}$ inch long.

teres. 258. H. imperforated, oblong, thin, brown; whirls 4; firſt ovate, and thrice as large as the next; aperture ovate.

ſubſtriata. 259. H. ſubimperforated, oblong, finely ſtriated with white; whirls 5; firſt twice as large as the next; aperture oval, margined; $\frac{1}{4}$ inch long.

trigonoſtoma. 260. H. ſmooth, brown; aperture triangular, margined; minute.

tumida. 261. H. ventricoſe, pointed, cinereous; firſt whirl large; aperture oval, large; margined on one ſide; $1\frac{1}{4}$ inch long.

acicula. 262. H. oblong, pointed, longitudinally ribbed, and tranſverſely ſtriated; whirls 10, equally decreaſing; aperture oval; $\frac{1}{4}$ inch long. Coromandel.

peregrina. 263. H. ovate, imperforated; whirls 8—9, round, diſtant, and equally decreaſing; aperture oval; $\frac{1}{2}$ inch long. American iſlands.

danubialis. 264. H. oblong, imperforated; whirls diſtant, ventricoſe; aperture orbicular; $2\frac{1}{2}$ inches long. Danube.

turbinata. 265. H. oblong, imperforated, ſmooth, pointed; whirls inflated; the firſt larger, the reſt gradually decreaſing; aperture ſuboval, margined; $3\frac{1}{2}$ inches long. Danube.

curvata. 266. H. oblong, curved, ſubimperforated; aperture oval, margined; $2\frac{1}{2}$ inches in diameter. Danube.

exilis. 267. H. thin, ſmooth, white, with cheſnut bands; ſpire obtuſe; whirls flattiſh; 8 lines to one inch long.

Gen. 30. NERITA, *Nerite.*

58 Nerita.

Gen. Char.—The animal is a limax; the ſhell univalve, ſpiral, gibbous, flattiſh at bottom; aperture ſemiorbicular, or ſemilunar; pillar lip tranſverſely truncated, flattiſh.

SPECIES.

A. Umbilicated.

canrena. 1. N. ſmooth; ſpire ſlightly pointed; umbilicus gibbous, and bifid. India, Africa, America.

cancellata. 2. N. with decuſſated ſtriæ, and impreſſed dots; ſpire ſubclavate; umbilicus gibbous, bifid. American iſlands.

glaucina. * 3. N. ſmooth, gloſſy, faintly wrinkled; ſpire rather obtuſe; umbilicus rather cloſed by the pillar lip, which is gibbous, and two-coloured; 2 inches long. Barbary, Europe, Britain.

vitellus. 4. N. ſubglobular; umbilicus perforated, equal. Indian ocean.

albumen. 5. N. convex; umbilicus ſomewhat heart-ſhaped, with a flattened lobe. Cape of Good Hope, Barbary, Indian iſlands. Extremely rare.

mammilla. 6. N. ovate, glabrous; umbilicus partly covered; whirls 4 or 5; aperture ovate.

leucozonias. 7. N. ſubglobular, ſolid, bay with white bands; ſpire ſomewhat depreſſed; whirls 4 or 5; an inch long.

8. N.

ſpadicea. 8. M. ſubglobular, ſolid; tip bluiſh; lateritious bands in the throat, and a white one on the beak. Mauritius iſland. Rather large.

rufa. 9. N. thin, rufous; umbilicus darker, with a white border; throat with a reddiſh band. Mauritius iſland.

fulminea. 10. N. ſubglobular, with angular, tawny lines, and flattened lobe; white or yellowiſh. Africa. Rare.

ſtercus-muſcarum. 11. N. ſmooth, ſnowy, with rufous ſpots and ſpecks; umbilicus gibbous, bifid. Mediterranean, American ſeas.

orientalis. 12. N. ſubglobular, poliſhed very ſmooth; baſe of the ſpire a little wrinkled; pillar ſnowy. Eaſtern ſeas.

cruentata. 13. N. ſubglobular, white, with red ſpots; lip obtuſe and bluiſh; umbilicus ſpiral.

rugoſa. 14. N. wrinkled; within glabrous; umbilicus bordered with white. American iſlands.

marochienſis. 15. N. ſubglobular, ſmooth, light green, browniſh within; livid at the tip; wrinkled at the angle of the whirls. Africa.

ſulcata. 16. N. ſubglobular, obliquely plaited; ſpire with 4 whirls, mucronate; umbilicus bifid.

arachnoidea. 17. N. white, reticulated with reddiſh lines, and blackiſh at the tip; umbilicus nearly covered; whirls convex.

vittata. 18. N. ſubglobular, brown, with a double white fillet in the middle; reticulated and denticulated on each ſide. Africa.

melanoſtoma. 19. N. thin, pellucid, ſmooth, oblong; firſt whirl ventricoſe, flat and large; umbilicus half cloſed; 2 inches long. Indian ſea.

pallidula. * 20. N. ſemitranſparent, horn-colour; whirls prominent; aperture ſemilunar, and patulous; umbilicus large; a ſmall ſhell. Coaſts of Kent and Dorſet.

papilla. 21. N. pellucid, thin, oblong, with decuſſated ſtriæ; dirty yellow; whirls 4; aperture ſuboval; pillar white; umbilicus half cloſed. Tranquebar.

clathrata. 22. N. depreſſed, ovate, tranſverſely undulated and longitudinally ribbed; ribs flat, oblique, and ſemilunar; ſpire papillary. Foſſil in Campania.

valvata. 23. N. flattiſh, with a circinated aperture. N. ſeas.

icelandica. 24. N. globular, ſubacute, thick; whirls 4, ſeparated by deep grooves. North ſeas.

affinis.] 25. N. globular, thick; ſpire ſubmucronated; whirls 3. New Zealand.

B. *Imperforated; lip toothleſs.*

corona. 26. N. whirls of the ſpire crowned with ſpines; minute. India, America.

radula. 27. N. grooved, with equal, tuberculated ribs; ſize of a walnut. Indian iſlands.

cornea. 28. N. obſoletely ſtriated; white or pale violent. Red ſea.

fluviatilis. * 29. N. rugged, ſpotted, ſtreaked, or mottled with white and purpliſh brown or pink; mouth cloſed with a teſtaceous operculum; 4 lines long. In ſlow rivers of Barbary and Europe, Britain.

littoralis. * 30. N. ſmooth, with a carious crown; whirls 4 or 5, firſt large; ſize of a horſe bean. Europe, Shores of Britain. Common.

lacuſtris. 31. N. ſmoothiſh, horny, or blackiſh, ending in a very fine point. Still waters and warm ſprings of Europe; ſuppoſed to be only a variety of N. *fluviatilis.*

magdalenæ. 32. N. grooves wide and black; within white; whirls 3; lip ſmooth, 2-toothed; 6 lines long. Magdalene iſlands.

marginata. 33. N. thin, with decuſſated ſtriæ, tuberculated; black with ochraceous ſpots; ſubglobular; aperture margined outwardly.

dubia. 34. N. thin, pellucid, ovate, poliſhed; dull yellow varied with black; outer lip acute; inner glabrous; crown prominent; very rare.

pellucida. 35. N. ſmooth, pellucid; whirls 3; very minute. Pembrokeſhire coaſt.

alba. * 36. N. ſmooth, ſomewhat pellucid; whirls 2; very minute. Pembrokeſhire coaſt.

C. *Imperforated; lips toothed.*

pulligera. 37. N. ſmooth, coarſe, with an excavated eye-like ſmall ſpire: inner lip ſmooth, crenulated; whirls 2, one large, terminating in an acute tooth; 14—16 lines long. Rivers of India.

undulata. 38. N. thin, ſmooth, undulated, with an obtuſe crown; outer lip ſubſtriated, and toothleſs; inner one a little denticulated. India.

aterrima. 39. N. thick, opaque, globular; deep black with coloured lines; outer lip glabrous; inner lip tuberculated, wrinkled.

larva. 40. N. ſmooth, ſubglobular; white, with yellowiſh brown bands; crown obtuſe; lip ſlightly denticulated; middle ſized. Amboyna. Rare.

pupa. 41. N. ſmooth, roundiſh, milk-white; whirls with tranſverſe, parallel, black ſtriæ; lip flat; teeth ſcarcely viſible.

bidens. 42. N. ſmooth; inner lip 2-toothed: ſize of a pea.

viridis. 43. N. ſmooth, green; inner lip crenulated in the middle. Minorca and Jamaica.

virginea. 44. N. ſmooth, ovate, inner lip denticulated; 2 to 10 lines long. India, South America.

polita. 45. N. ſmooth; crown obliterated; lip toothed on each ſide; brown. India, South ſeas.

peloronta. 46. N. ſtriated; lips toothed; inner one flattiſh and wrinkled. American iſlands.

albicilla. 47. N. ſtriated; lips ſlightly toothed; inner one tuberculated. Cape of Good Hope. Indian ocean.

hiſtrio. 48. N. grooved, tranſverſely ſtriated; inner lip toothed; ribs 30, unequal.

plicata. 49. N. grooved; 17 to 20 tranſverſe ribs; outer lip 5 or 6 teethed within; inner convex, wrinkled, with three long, ſtrong teeth, beſide leſſer ones. India.

groſſa. 50. N. grooved, lips toothed; inner lip with a yellow ſpot, and 3 or 4 teeth; convex and wrinkled. Molucca iſlands.

chamæleon. 51. N. with 20 grooves, varied with undulated alternate black and white rays; lips toothed; inner one wrinkled and tuberculated. Indian ocean.

undata. 52. N. grooves 30; ribs about 30, flattened; lips toothed; inner one wrinkled and tuberculated. Indian ſeas.

exuvia. 53. N. grooved, with 15 to 19 ribs; lips toothed; inner one tuberculated. India.

maxima. 54. N. ſolid, thick, glabrous; undulated with black and yellowiſh rays; outer lip toothleſs; inner one concave, 4-toothed; a very large ſhell.

textilis. 55. N. angular black lines; with 16 crenated ribs and grooves; outer lip crenated without, and toothed within; inner lip wrinkled above, and tuberculated beneath.

atrata. 56. N. deep black, glabrous, and thinly ſtriated above; both lips white; outer one finely grooved, and ſlightly toothed within. Atlantic and South ſeas.

aſcenſionis. 57. N. with 16 white grooves; ribs ſpotted with white; crown a little prominent; outer lip glabrous on each ſide; inner one concave, yellowiſh and toothed. Aſcenſion iſland; a large ſhell.

lineata. 58. N. mouth and lips white; whirls round, ſurrounded with black, parallel ſtriæ; outer lip ſtriated within. Malacca ſeas.

verſicolor. 59. N. with blackiſh bluiſh, red and white ſquare ſpots, and bands, ſpotted with red and white; inner lip ſtriated within, and toothed on each ſide. Antilles iſlands.

pica. 60. N. white, radiated with black without; ſtriæ tranſverſe, rounded, ſmooth; inner lip wrinkled and 4-toothed. Indian ſeas.

coſtata. 61. N. yellowiſh within, ſubglobular, ſurrounded with thicker ſtriæ; interſtices ſnowy; lips white, toothed; outer one crenated without. Nicobar iſlands.

quadricolor. 62. N. ſubviolet with a yellowiſh tip; white within, with elevated black ſtriæ; lips toothed; outer one grooved within; inner one wrinkled. Red ſea.

malaccenſis. 63. N. grooved, yellowiſh within; crown a little prominent; outer lip unarmed and crenulated outwardly; inner lip yellowiſh, ſmooth. Malacca.

antillarum. 64. N. ſubglobular, black; white within; grooved and ſtriated; lips wrinkled and denticulated. Antilles iſlands.

flammea. 65. N. ſubglobular, with crowded tranſverſe ſtriæ; white, with purpliſh undulated rays; outer lip grooved within; inner lip wrinkled above.

fulgorans. 66. N. ſubglobular, with crowded tranſverſe ſtriæ; deep black with ochraceous rays; lip ſlightly denticulated; inner one tuberculated in the middle. American iſlands.

teſſelata. 67. N. obtuſe, tranſverſely ſtriated; the ſtriæ marked with nearly ſquare black and white ſpots; both lips denticulated; outer lip ſlightly ſtriated within, inner lip with one or two teeth; concave, glabrous, and denticulated beneath. Iſlands between Africa and America.

bifaſciata. 68. N. blackiſh with 2 gray bands; crown white. India.

literata. 69. N. ſubglobular, white, with various characters; inner lip crenulated, toothed. India.

violacea. 70. N. ovate, ſolid, ſmooth, violet dotted with white; inner lip denticulated beneath.

ſenegalenſis. 71. N. ovate, obtuſe, deep black; whirls 3, the firſt turgid with 25—30 grooves; the two others very minute; 1 inch broad. Senegal.

promontorii. 72. N. black, ovate, pointed; whorls 3, with 30 grooves; left lip wrinkled. Africa.

tricolor. 73. N. variegated with red, black, and white; right lip with 10 teeth; left lip glabrous, with three large emarginated teeth; 9 lines long.

perverſa. 74. N. ſurrounded with belts; ſpire reverſed; aperture 8-toothed. Found only in a foſſil ſtate.

turrita. 75. N. bands alternately white and black; within white; crown much elevated; outer lip acute; whirls 4. Freſh waters in Antilles iſlands.

aculeata. 76. N. blackiſh, tranſverſely ſtriated; the ſtriæ ſpinous; inner lip flattiſh, smooth, and ſlightly toothed. India.

59 Haliotis.

Gen. 31. HALIOTIS, *Sea-ear.*

Gen. Char.—The animal is a limax; the ſhell is univalve, dilated, ear-ſhaped, with a longitudinal row of orifices along the ſurface; ſpire lateral and nearly concealed.

SPECIES.

midæ. 1. H. *Midas' ear;* roundiſh, both ſides poliſhed; orifices from 8 to 10; 7 to 9 inches long. Indian ocean, Cape of Good Hope.

tuberculata. 2. H. ſubovate; outſide tranſverſely grooved, rugged and tuberculated; wrinkles on the outſide undulated. The inner margin of the ſhell has a ridge the whole length, which terminates in one ſpiral turn at the end. This ridge is beſet with tubercles, the laſt 6 of which, or from 6 to 9, are open. The inſide is open, concave, and of a beautiful mother-of-pearl: the length is from 3 to 4 inches; breadth from 2 to 3. It is found on the ſhores in the ſouth of England, after violent ſtorms. It is common in the iſland of Guernſey, adhering to the rocks at the loweſt ebb. The fiſh is eaten by the inhabitants, and the common people adorn their houſes, with the ſhells, by ſticking them on the outſide with plaſter.

ſtriata. 3. H. ovate, ferruginous, tranſverſely wrinkled, and longitudinally ſtriated; 4 or 5 orifices open. Aſia, Barbary.

varia. 4. H. ovate, longitudinally ſtriated; larger ſtriæ tuberculated; orifices 20 to 30; 4 to 5 open. India.

marmorata. 5. H. oval, longitudinally ſtriated, with obſolete tranſverſe ones; orifices about 30, 4 to 5 open; 2 to 4 inches long. Africa, India.

aſinum. 6. H. *aſſes ear;* ſmoothiſh, oblong; margin ſomewhat falcated; nerves on the outſide elevated; orifices about 30, 5 to 7 open; 3 inches long. India.

parva. 7. H. ovate, red, with an elevated angle on the belly; orifices 30, 4 or 5 open. Africa, India.

biſtriata. 8. H. ovate, greeniſh, ſpotted with brown; ſtriæ elevated, double, tranſverſe; 6 orifices open. Africa.

auſtralis. 9. H. varied with gray, bluiſh, and red; ovate; ſpire prominent, inflated; 7 to 9 orifices open; 3 inches long. New Zealand.

guineenſis. 10. H. ovate, ſomewhat convex, ſolid, with decuſſated ſtriæ; orifices flattened; 6 open; 2½ inches long. Guinea.

imperforata. 11. H. ovate, imperforated, with prickly ribs; ſpire exſerted; 1 inch long. India. Extremely rare.

perverſa. 12. H. ovate, imperforated; margin oblique above, and tuberculated within; ſpire reverſed; ½ inch long. Foſſil.

plicata. 13. H. tranſverſely plaited on the outſide; margin broad, thick, and finely ſtriated longitudinally; ¼ inch long. Foſſil near Hildeſia.

glabra. 14. H. ovate, ſmoothiſh, ſolid; varied with white and green; 6 orifices open; 2½ inches long.

pulcherrima. 15. H. roundiſh, varied with roſy and white; outer lip crenated; orifices 30, 6 pervious; 7 lines long. South ſea iſlands.

virginea. 16. H. ovate, with decuſſated undulated ſtriæ; under ſide irideſcent; 6 orifices open; 1¼ inch long. New Zealand.

ovina. 17. H. ſuborbicular, depreſſed, wrinkled; varied with white, cheſnut, and yellowiſh; orifices in the middle pervious.

gigantea. 18. H. oval, rugged, varied with white and red; ſpotted; inner lip with a very broad margin; 3 to 7 orifices open.

iris. 19. H. ear ventricoſe, fulvid brown, with tranſverſe wrinkles, and longitudinal, tuberous plaits; under ſide irideſcent; 4½ inches long. New Zealand. Extremely rare.

60 Patella.

Gen. 32. PATELLA, *Limpet.*

Gen. Char.—The animal is a limax; the ſhell univalve, ſubconic, ſhaped like a baſon, without ſpire.

SPECIES.

A. *Having an internal lip; ſhell entire.*

equeſtris. 1. P. orbicular, perfoliated outwardly; lip vaulted, perpendicular; 1 inch wide. Indian and American ſeas.

neritoidea. 2. P. ovate; tip ſubſpiral; lip lateral; ſize of a cherry; inhabitant red.

ſinenſis. * 3. P. ſubconic, ſmooth; lip ſomewhat lateral. Mediterranean and Indian ſeas. On oyſters in Salcomb-bay, Devonſhire.

porcellana. 4. P. oval; tip recurved; lip placed behind and flattened. India and Goree.

fornicata. 5. P. oval, obliquely recurved behind; lip placed behind, and concave. Barbadoes, Mediterranean.

aculeata. 6. P. oval, brown, with prickly ſtriæ; crown recurved. American iſlands.

trochiformis. 7. P. conic, longitudinally plaited; internal lip lateral. Tranquebar and Falkland iſlands.

auricula. 8. P. roundiſh, with radiated grooves, and ſtriated; crown recurved; internal cavity ear-ſhaped. Borneo, Santa Cruz.

rugoſa. 9. P. ovate, thin, obſoletely wrinkled tranſverſely; margin unequal; lip unequally repand; above 1 inch long. China. It is generally found on the *buccinum ſpiratum.*

goreenſis. 10. P. oval, flat, thin, white, gloſſy, lamellated on the outſide; 5 to 6 lines in diameter. Rocks at Goree.

contorta. 11. P. granulated with white, and fine perpendicular, oblique ribs; lip thin, oblique, and covering half the cavity. Rare.

explanata. 12. P. white, finely ſtriated; crown inclining downwards and dilated, behind which the ſhell is depreſſed.

plicata. 13. P. conic, ochraceous, with ferruginous rays within; with longitudinal, tranſverſely ſtriated plaits.

ſtriata. 14. P. white, conic, ſtriated; grooves undulated; crown a little lateral,

ſolea. 15. P. twiſted, pellucid, with ferruginous ſpots; thinly plaited and tranſverſely grooved above; lip undulated, repand; ½ inch long.

echinata. 16. P. conic, prickly; within glabrous. Found foſſil near Crignon.

B. *Margin angular, or irregularly toothed.*

crepidula. 17. P oval, flattiſh, ſmooth; lip ſemilunar, flat behind. Mediterranean.

laciniosa. 18. P. rays unequal, elevated; thicker and obtuſe, on the outſide. India.

ſaccharina. 19. P. angular, with 7 keel-ſhaped, obtuſe ribs. Java and Barbadoes.

barbara. 20. P. toothed, with 19 elevated, vaulted, and muricated rays. Falkland iſlands.

granularis. 21. P. toothed, with elevated, angular, imbricated ſtriæ; 2 inches long. Southern Europe, and Cape of Good Hope.

granatina. 22. P. angular, with numerous muricated ſtriæ; 1½ to 3 inches long. Jamaica, ſouthern Europe.

vulgata. * 23. P. with about 14 obſolete angles, and dilated, acute, crenated margin; crown central; 2 inches high. Marine rocks of Europe and India, Britain.

depreſſa. * 24. P. oblong with about 14 angles; crown lateral. Rocks of Europe, Britain.

cerulea. 25. P. crenated, ſubangular; ſtriæ numerous, unequal; beneath blue; blackiſh, on the outſide. Mediterranean.

tuberculata. 26. P. conic, tuberculated; tubercles white, in rows; ſlightly toothed; retuſe behind.

lepas. 27. P. roundiſh, pectinated; rays imbricated, tuberculated, and tranſverſely ſtriated; crown incurved; 2½ inches long. Chili, Falkland iſlands.

tricoſtata. 28. P. oval, three-ribbed, white; ſtriated at the ſides; internal margin flattiſh, a little jagged. Indian ocean.

mytilina. 29. P. carinated, rounded on the fore-part, with undulated ſtriæ; brown and pearly within; hinder margin crenated; 1 inch long. South America.

ovata. 30. P. toothed, oval, conic, ſomewhat compreſſed; ribbed; brown between the ribs; brown within, with white grooves; 9 lines long.

ſtellata. 31. P. angular, ovate, depreſſed; rays 10, elevated, with ſhort, intermediate ribs; 8 lines long.

icelandica. 32. P. ſolid, ovate, gibbous; unequally ribbed; glabrous within, with alternate, cinereous, and horny rays; margin crenated; 1½ inch long. Shores of Iceland.

cypria. 33. P. oval, ſubpellucid; ribs 16 to 20; tuberculated and foliaceous on the outſide; 1 to 3 inches long. Shores of Cyprus.

coſtata. 34. P. ovate, a little gibbous, white; ribs 20 to 40; keel-ſhaped, crowded, unequal, tuberculated; 2 inches long.

leucopleura. 35. P. ovate, duſky; ribs ſmooth, unequal, white, crowded; crown uſually brown; 1 inch long.

ſtriatula. 36. P. a little rugged, white, with brown, flexuous ſtriæ, branching outwards; 2 brown ſpots in the bottom of the hollow.

octoradiata. 37. P. convex; ribs 11 to 16; 8 larger, tuberculated; 1¼ inch long. American iſlands.

rubra. 38. P. toothed; red under the brown ſkin, with elevated, rounded ſtriæ, and leſſer imbricated ones; within white; 1½ inch long.

hepatica. 39. P. ovate, gibbous, thin; toothed, liver-colour; ſtriæ elevated, keel-ſhaped and obtuſely ſpined; crown white; 1½ inch long.

badia. 40. P. ſubconvex, brown; with 12 larger rays, each ſurrounded by a rib, and as many leſſer ones: 2¾ inches long.

fuſceſcens. 41. P. flattiſh, brown, with 10 elevated ſtriæ; crown of a different colour; bottom of a pale liver colour; ſpatulated ſpot, edged with glaucous and gold; inner margin brown; 2 to 3 inches long.

maculoſa. 42. P. flattened; forepart narrow and rounded; yellowiſh ſpotted with brown; crown white; rays 10 or 11 equal, rounded, flat; ¼ to 1 inch long.

rotundata. 43. P. ſuboval, flattened, varied with brown; ribs flat, rounded; crown and bottom differently coloured; 1 to 2 inches long.

pecten. 44. P. ovate, obſcurely edged with white; radiated, ed, ſtriæ diſtant, pectinated outwardly; crown gray; 1 to 2 inches long. North America.

corrugata. 45. P. ovate, wrinkled, cheſnut; crown with a white circle; ½ inch long.

alboradiata. 46. P. oval, brown, radiated with white on each ſide; ſtriæ elevated, pectinated; crown white; bottom yellowiſh; ¾ inch long.

olivacea. 47. P. ovate, olive-coloured; within brown varied with white, with elevated unequal ſtriæ; margin with 2 rows of unequal ſpines; brown, pale yellow; 1½ inch long.

cerea. 48. P. ovate, wax-colour on both ſides; perpendicularly ſtriated; ribs 13, flattened; bottom white; ½ inch long.

impreſſa. 49. P. ovate, with ſtriæ elevated, tranſverſe, browniſh; ſpotted with white, and reaching half way down; crown with a white, impreſſed circumference; and 3 browniſh ſpots; ¾ inch long.

aurantia. 50. P. ovate, ſolid, citron undulated with brown; ſtriæ elevated, crowded, wrinkled; bottom white; 1 inch long.

cingulum. 51. P. ovate, denticulated, cinereous, with three black belts; within milk-white, with elevated, unequal ſtriæ, nodulous on the outſide, and ſpinous at the margin; 1 inch long; crown acute, reddiſh or whitiſh.

oculata. 52. P. ovate, white; ribs flattened, of unequal lengths; interſtices browniſh; crown obtuſe, with a brown belt; ½ inch long.

magellanica. 53. P. thin, ovate; margin knotty; within pearly, with elevated cheſnut ſtriæ; crown pointed, brown; ½ inch long. Straits of Magellan.

ochroleuca. 54. P. ochraceous, with three yellow bands, and elevated, acute, unequal ſtriæ; crown white; 1 inch high.

dentata. 55. P. white, denticulated; ſtriæ unequal, elevated, acute; crown ſurrounded with a double row of cinereous dots, and a duſky gray band; 1 inch long.

nodoſa. 56. P. yellow, radiated with brown; ſtriæ unequal, elevated, knotty; crown and bottom white; 1½ inch long.

cinerea. 57. P. toothed, cinereous; ſtriæ unequal, elevated; interſtices brown and rugged; crown pointed; milk-white or ſilvery.

exalbida. 58. P. whitiſh, rays browniſh, and ſtriæ unequal, elevated, rounded; interſtices rugged; crown obtuſe, white, with a broad, interrupted brown band, and another marginal one; ¼ inch long.

cancellata. 59. P. cinereous and brown, with decuſſated ſtriæ, and 2 rows of tubercles; crown yellowiſh; bottom with a ſpatulated white ſpot; 1½ inch long. Jamaica.

lævis. 60. P. rounded, ſmooth, yellowiſh, with a broad, citron, marginal band, ſpotted with brown, and another narrower one; margin dilated, acute; crown varied with bluiſh and white; 1½ inch long.

argentea. 61. P. ſmooth, thick, ſilvery; rays 11, brown; margin ſilvery: crown pale yellow; bottom ivory, with a double white ring; 2 inches long. Very rare.

cuprea. 62. P. white, with ſtrong, rounded, brown ribs; pearly within; crown and bottom copper-coloured; 2 inches long.

rubida. 63. P. pale liver-colour on both ſides; ribs keel-ſhaped, alternately larger and leſs; crown flat, white; 1¼ inch long.

glabra. 64. P. brown, glabrous above; ſtriæ beneath elevated, crowded, white; crown obtuſe, white; border fulvous; bottom fulvous; 1¼ inch long.

flaveola. 65. P. yellowiſh, varied with brown; ribs unequal, flattened; crown obtuſe; bottom varied reddiſh and white; 1 inch long.

infundibulum. 66. P. denticulated, compreſſed on each ſide; rounded, yellow, perpendicularly ſtriated; ribs keel-ſhaped; bottom varied, white and cinereous; 1¼ inch long. Rare.

cyathus. 67. P. rounded, glabrous, white; a ſmall ſhell.

ſinica. 68. P. ovate, entirely yellow, with undulated grooves; perpendicularly ſtriated within; margin ſcalloped here and there; 3 inches long. China.

punctata. 69. P. roundiſh, white, with many coloured dots; radiated at the baſe, and ſurrounded with 2 brown rings; margin flexuous.

lugubris. 70. P. ovate, with annular ſtriæ; black, with elevated, unequal ſtriæ; margin crenated; crown and bottom white.

ulyſſiponenſis. 71. P. ovate, toothed, yellowiſh, with elevated flattened ſtriæ; crown pointed, orange. Liſbon.

umbella. 72. P. oblong, red, with elevated, unequal, white ſtriæ; margin crenated. Africa.

crenata. 73. P. thin, pellucid, ſtriated, blackiſh with olive rays; within glaucous or cinereous; crown pointed; margin crenated, bottom milk-white. Shores of Africa, Malaga, Liſbon.

ferruginea. 74. P. ferruginous, with angular or undulated ruſſet lines and cinereous belts; within milk-white, with elevated, knotty ſtriæ; crown pointed; margin plaited.

melanogramma. 75. P. oval, ochraceous, with elevated black ſtriæ; within ſilvery, ſpotted; crown pointed, white, ſmooth, bottom with a ſtraw-coloured ſpot.

repanda. 76. P. ovate, thin; margin flexuous; within ſilvery, with browniſh rays, and thin, undulated ſtriæ, with bay granulations. Seas of Magellan.

anguloſa. 77. P. oval, white, thinly ſtriated, and varied with red ſpots and dots; margin with 8 angles.

tigrina. 78. P. oval, ſmooth, poliſhed, pellucid, ſtriated with 7 yellowiſh ribs; bluiſh olive dotted with brown; margin with 7 angles.

monopis. 79. P. oblong, flattiſh; bay ſtriated with white; within milk-white, with 11 elevated, unequal ſtriæ; crown rounded, white. American iſlands.

chloroſticta. 80. P. ovate, toothed, brown dotted with green; with 11 elevated, hollow, broader ſtriæ, and as many narrower ones; crown white.

margaritacea. 81. P. thin, white, unequally ſtriated, within pearly; crown with an orange mark, ſurrounded with a yellow ring: margin crenated. Iceland.

tenuiſſima. 82. P. oval, thin, ochraceous, with angular cheſnut lines, and 10 to 12 elevated, obtuſe, hollow, unequal ſtriæ.

mitrula. 83. P. ſolid, ſubconic, tranſverſely plaited; margin flexuous. Barbadoes.

plicaria. 84. P. ovate, toothed, with 30 elevated, obtuſe, undulated, and tranſverſely wrinkled ſtriæ. Shores of Magellan.

pentagona. 85. P. whitiſh, obtuſely pentangular; margin crenated, dilated; crown obtuſe; bottom reddiſh.

ænea. 86. P. ovate, tender, pellucid; ſtriæ elevated; crown and bottom copper-coloured; 1¼ inch long. Straits of Magellan.

conchacea. 87. P. thin, oblong, ovate, with fine undulated ſtriæ; yellowiſh with elevated dark rays; crown recurved. South America.

ſtannea. 88. P. ovate, ſilvery; ſtriæ elevated, flattened; crown obtuſe, copper colour; bottom with an oval bay mark; margin flexuous; 1 inch long.

candidiſſima. 89. P. ſuborbicular; ſtriated; white, with a browniſh band; dotted with brown; margin tranſverſely wrinkled.

C. *With the tip or crown pointed and recurved.*

hungarica. * 90. P. entire, conic, pointed, ſtriated, with a hooked, revolute crown; 2 inches high. America, Mediterranean, and Aſiatic ſeas; ſhores of Britain.

imbricata. 91. P. entire, oblong, imbricated; the crown placed behind.

mammellaris. * 92. P. entire, conic, ſtriated, ſubdiaphanous, with a ſmooth reflected crown. Shores of the Mediterranean and Africa, Britain.

tricarinata 93. P. ſubſtriated, with 3 ribs on the forepart; 2½ inches high.

pectinata. 94. P. entire, ovate, with wrinkled, ſlightly branched ſtriæ; crown nearly central; 2 inches long. Mediterranean.

lutea. 95. P. entire, oval, convex, ſtriated, with a ſubmarginal, reflected, mucronate crown; ſize of a melon ſeed. India.

criſtata. 96. P. crown revolute; back creſted, keel-ſhaped.

lacuſtris. 97. P. entire, oval, membranaceous, with a central, mucronate, reflected crown; 1½ to 2½ lines long. Freſh waters of Europe, Britain.

fluviatilis. 98. P. entire, oval, a little horny, with a marginal, mucronate crown; aperture oval; 2½ lines long. Rivers of Europe, Britain.

cæca. 99. P. entire, with elevated dots and ſtriated; crown acute, ſtraight. Bays of Norway, on ſtones.

virginea. 100. P. entire, white, with 18 red bands. Bays of Norway, on fuci.

teſſelata. 101. P. entire, whitiſh, teſſelated with red. Norway, on rocks and fuci.

fulva. 102. P. entire, orange, with a mucronate and nearly vertical crown. Norway.

ſubſpiralis. 103. P. ovate, with an obtuſe, nearly ſpiral tip. Norway.

ambigua. 104. P. ovate; margin ſlightly toothed; point reflected, ſomewhat acute. Norway.

rubicunda. 105. P. entire, ſubconic, ſmoothiſh, and reddiſh; 2½ lines long. Deeps of Greenland.

borniana. 106. P. ovate, entire, finely ſtriated longitudinally; white with red veins; 6 lines long.

calyptra. 107. P. entire; ribs ſomewhat imbricated; crown hooked; margin ſinuated. North America.

melanoleuca. 108. P. ſtriated, entire, alternately black and white; 1 inch long.

pectunculus. 109. P. oblong, convex, ſlightly toothed, within poliſhed; ſtriæ knotty, elevated; crown bent forwards; 1 inch long.

faſciata. 110. P. ovate, white, with a brown band; ſtriæ elevated, acute; margin dilated, crenated, and cinereous within; 1 inch long.

elegans. 111. P. with decuſſated ſtriæ, white radiated with red; denticulated; crown gray; 2 inches long.

ſquamoſa. 112. P. ſtriæ elevated, and tranſverſely undulated on the outſide; brown, ſilvery towards the margin; crown hooked and bronzed; 3½ inches long.

ſqualida. 113. P. entire brown, whitiſh within; margin bluiſh, radiated with brown, with elevated, obſolete ſtriæ; crown knotty.

crocea. 114. P. ſmooth, ſubangular, yellow radiated with brown; crown obtuſe, white; 1 inch long.

candida. 115. P. ovate, ſmooth, white on both ſides, with a roſy belt on the outſide; crown lateral; ½ inch long.

trigona. 116. P. compreſſed, convex in the middle, cancellated, white, with a browniſh band on the outſide, and margined within; crown marginal, obtuſe; ½ inch long.

minima. 117. P. rounded, convex, thin; whitiſh with red ſpots; crown obtuſe, white, marginal; ¼ inch long. Ferro iſlands.

tranquebarica. 118. P. ovate, thin, pellucid, with fine crowded ſtriæ; cheſnut with white ſcales, within milk-white; with a brown ſpot at the bottom, and azure ſpot on the crown. Tranquebar.

perverſa. 119. P. oblong, horny, very thin, pellucid, glabrous, with a ferruginous baſe. Africa.

cernua. 120. P. with decuſſated grooves; thin, pale, fleſh-colour; aperture oblong.

incurva. 121. P. entirely white, flat; point of the crown twiſted.

interrupta. 122. P. oval, depreſſed, browniſh, with green dots, diſpoſed in oblique, interrupted rays; crown with an obtuſe hook; 1 inch long.

D. *Entire, and not pointed at the tip or crown.*

afra. 123. P. conic, ſtriated, greeniſh or pale brown; within white; crown glabrous, white, obtuſe; margin glabrous. Iſland of Goree.

luſitanica. 124. P. conic, white, with brown rays marked with ſtriæ granulated with black; crown acute, ſurrounded with a cheſnut ring; very ſmall. Portugal, on the ſea rocks.

radiata. 125. P. rounded, convex, gray, with decuſſated ſtriæ; crown pointed, central, and marked with 12 orange, radiated lines; bottom horny. Jamaica.

areolata. 126. P. pyramidal, reddiſh gray, with thin, circular ſtriæ croſſed by longitudinal ones; crown violet.

flammea. 127. P. ovate, with fine annulated ſtriæ, reddiſh gray, with undulated brown rays; crown acute, central; white in the middle.

indica. 128. P. reddiſh gray, with radiated ſtriæ, glabrous, narrower on one ſide; crown acute, ſmooth, ſurrounded with a reddiſh ring; 3¼ inches long. India.

ſurinamenſis. 129. P. thick, ſubovate, yellowiſh, with black rays, and longitudinal, unequal ſtriæ; and ſurrounded with knotty belts; crown obtuſe, ſmooth, white. Surinam.

vitellina. 130. P. ovate, yellow; baſe unequally ſtriated; crown whitiſh, obtuſe.

ſanguinolenta. 131. P. ovate, convex, white, ſolid, with flexuous, elevated, longitudinal ſtriæ, intermixed with capillary ones; crown lateral, ſurrounded with a broad ring, dotted with red. Africa.

lævigata. 132. P. ovate, yellow, within bluiſh white, with oblique flattened ſtriæ, alternately thicker and thinner; crown white, ſmooth, poliſhed.

punctulata. 133. P. rounded, white, with many-coloured dots, radiated towards the baſe, and ſurrounded with 2 brown rings.

pellucida. * 134. P. entire, obovate, gibbous, pellucid, with 4 blue rays; ſize of a walnut. European and northern ſeas, ſhores of Britain.

teſtudinaria. 135. P. entire, acute, ſmooth, glabrous. Indian and North ſeas.

teſtudinalis. 136. P. entire, ovate, ſtriated; crown obtuſe, nearly central; 14 lines long. Greenland ſeas.

compreſſa. 137. P. entire, oval, oblong, ſtriated, ſmooth; compreſſed on the back; 14 inches long. India.

ruſtica. 138. P. entire, conic, with 50 obtuſe ſtriæ; three inches long.

fuſca. 139. P. entire, ovate, obtuſe, with 39 cinereous, filiform, elevated ſtriæ.

notata. 140. P. entire, ſtriated, with a ſubmucronate, erect crown; within white, with a black, heart-ſhaped ſpot, white in the middle; minute. Mediterranean.

cruciata. 141. P. entire, oval, ſubconvex; brown, with a white croſs; 1 inch long.

reticulata. 142. P. entire, conic, compreſſed, with reticulated veins.

deaurata. 143. P. oval, entire, gilded; within ſilvery, with ſomewhat imbricated ſtriæ; margin with plaited teeth. Straits of Magellan, and Falkland iſlands.

ſtellifera. 144. P. oval, entire, ſtriated; black brown radiated with white; within ſilvery. Friendly iſlands and New Zealand.

radians. 145. P. entire, oval, pellucid, depreſſed, ſtriated, horny, and radiated with black ſpots. New Zealand.

rota. 146. P. roundiſh; the inſide ſilvery; the outſide with reddiſh ſtreaks, and a yellowiſh border. Indian and American ſeas.

umbellata. 147. P. entire, roundiſh, diaphanous; depreſſed with yellowiſh rays within; crown pale yellow; margin very acute; 4 inches long. Indian ocean.

puſtulata. 148. P. thin, oval, depreſſed, radiated, white, dotted with red; within ſmooth; 6 lines long.

ſymmetrica. 149. P. ovate, conic, ſolid; brown divided into partitions, by perpendicular white lines; within ſmooth, white; margin cut archwiſe; 6 lines long.

citrina. 150. P. ovate, convex, with fine decuſſated ſtriæ; white, with two broad yellow bands; within whitiſh, with a milk-white bottom; crown browniſh; near 2 inches long.

capenſis. 151. P. oval, with decuſſated ſtriæ, longitudinal ones alternately brown and white; within pearly, with a white bottom; 1¼ inch long. Cape of Good Hope.

anomala. 152. P. coarſe brown, orbicular, with the crown near the margin. Deeps of the ſeas of Norway.

guttata. 153. P. finely ſtriated and varied with dots of different colours; bottom duſky; 1½ inch long.

mytiliformis. 154. P. glabrous, lead colour, with a white, horſe-ſhoe-ſhaped band within; ¼ inch long. Ferro iſlands.

ſcutiformis 155. P. oval, thin, black, with white perpendicular flattened ſtriæ; crown gray; bottom with a browniſh ſpot; not an inch long.

cochlearis. 156. P. white, flattiſh; one part narrow, channelled within, with a bluiſh callus, ſhaped like a horſe-ſhoe; the other part rounded; 1 to 2 inches long.

craticulata. 157. P. oval, thin, depreſſed, cancellated, radiated; 1 to 1¾ inch long.

cruentata. 158. P. oval, convex, varied with red, and ſlightly toothed, with elevated, unequal rough ſtriæ; 1 to 2 inches long.

papyracea. 159 P. depreſſed, thin, hyaline, dotted with red, with cheſnut rays outwardly, and crowned thinner, and granulated thicker ſtriæ; an inch long.

cylindrica. 160. P. oval, flat, with crowded longitudinal ſtriæ, of unequal thickneſs and all granulated; an inch long.

decuſſata. 161. P. ſomewhat convex; white, with crowded red dots; within radiated with red and white, with decuſſated glabrous ſtriæ, and a few longitudinal, thicker, white ones; 1¾ inch long.

hematoſticta. 162. P. thin, depreſſed, white, dotted with red; within browniſh, ſtriated; crown varied with cinereous and browniſh; near an inch long.

aſteroides. 163. P. flattiſh, cancellated, cinereous, with a cheſnut ſtar, and rays towards the margin; crown ſmooth, gray, ſurrounded with brown dots; an inch long.

ovalis. 164. P. oval, ſomewhat convex, thin; ſtriæ crowded; gray, with blackiſh rays and ſpots; an inch long.

rubella. 165. P. a little convex, ſtriated, reddiſh; crown whitiſh, ſpotted with red; bottom whitiſh; 1½ inch long.

ſpectabilis. 166. P. flattiſh, a little wrinkled; ſtriated, reddiſh white, with a cheſnut band towards the crown, and another bay one at the margin; 3 inches long.

conſpurcata. 167. P. ſolid, flattiſh, ſtriated; black, with cinereous dots; within bluiſh; crown dirty yellow; two inches long.

melanoſticta. 168. P. ſolid, flattiſh, ſtriated; whitiſh, with cinereous rays and black dots, diſpoſed in 5 or 6 belts; crown pointed and whitiſh.

atra. 169. P. black, ſtriated, with a paler crown; bottom with a browniſh mark, ſurrounded with a white horſe-ſhoe-ſhaped band; 1¼ inch long.

ſpecularis. 170. P. oval, convex, ſolid, glabrous; liver colour within, and the crown browniſh; the latter ſurrounded with a white border, and interrupted, whitiſh band.

caneſcens. 171. P. oval, black, within bluiſh, ſtriated; the larger ſtriæ flattened and gray; crown obtuſe, browniſh, with a whitiſh area; 2 inches long.

vireſcens. 172. P. oblong, flattiſh, dilated on each ſide and ſtriated; olivaceous, radiated, and ſpotted with white; within blue; 1¼ inch long.

pulla. 173. P. rounded, convex, longitudinally ſtriated and tranſverſely wrinkled, browniſh; within ruſſet brown, with whitiſh and browniſh rays, and two milk-white bands above; 1½ inch long.

revoluta. 174. P. ſuboval, crenated, ſtriated, ochraceous, with red ſpots and rays, broader on one ſide; margin revolute; an inch long.

ſquamata. 175. P. ovate, convex, ſtriated; the ſtriæ ſcaly, varied with white and black; crown gray, nearly central; an inch long.

teſtacea. 176. P. ovate, finely ſtriated, teſtaceous, with 3 tranſverſe browniſh rings; within pale yellow, with a whitiſh bottom; an inch long.

capillaris. 177. P. ovate, thin, brown, with darker bands and paler ſtriæ; within browniſh; crown and bottom white; ¾ inch long.

glauca. 178. P. ovate, narrower on one ſide, finely ſtriated; bluiſh, with a white band towards the margin, and another bluiſh one; crown and margin white; ¾ inch long.

obſcura. 179. P. ovate, flattiſh, ſtriated; varied with yellowiſh and brown, and dotted with green; within brown; crown bay; ſcarcely ½ inch long.

exoleta. 180. P. oval, ſubconvex, unequally ſtriated; whitiſh, with a few black lines, reaching half way; near an inch long.

affinis. 181. P. oval, flattiſh, ſolid, with a few black rays, reaching half way; bottom with a ſpatulated white ſpot; ¾ inch long.

rotalis. * 182. P. white, opaque, flat, round; margin regularly toothed.. Sandwich. Rare.

fuſcata. 183. P. ovate, convex, finely ſtriated and varied with brown.

mellea. 184. P. rounded, ſolid, glabrous, honey-colour; white within; crown browniſh; margin ſpotted with brown, and ſilvery within; ¾ inch long.

anceps. 185. P. ſolid, glabrous, pointed, pale cheſnut; pale fleſh-colour within.

guineenſis. 186. P. ovate, convex, ſmooth; one ſide broader, and cheſnut; the other with the crown pale yellow; margin fleſh-colour on each ſide; ¾ inch long. Guinea. Rare.

complanata. 187. P. depreſſed, hemiſpherical; obſoletely cancellated, varied with white and browniſh; margin white on one ſide.

virgata. 188. P. ovate, longitudinally ſtriated; whitiſh, with brown rays and crown; pearly within.

nivea. 189. P. ſubconic, ſolid, glabrous, ſnowy; with 7 to 8 tranſverſe concentric rings; crown rounded; 4 lines wide. Africa.

griſea. 190. P. oval, with crowded radiated grooves, poliſhed within; crown nearly central; an inch long. Africa.

navicula. 191. P. narrow, with decuſſated ſtriæ; roſy, with a whitiſh callous belt on one ſide in the middle; margin acute, revolute on each ſide; an inch long.

cingulata. 192. P. ſomewhat oval, obſoletely ſtriated, ferruginous, with two elevated, obſcurely barred belts; crown nearly central.

ſcapha. 193. P. clear white, with undulated ſtriæ, narrow; broader ſide with an acute callus; narrower ſide repand; crown towards the narrower ſide; 1¼ inch long.

parva. * 194. P. ſmall, entire, without gloſs, whitiſh, faintly radiated with red; rather larger than a pea. Devonſhire coaſts. Very rare.

E. *With the crown or tip perforated.*

fiſſura. * 195. P. oval, conic, with reticulated ſtriæ; cleft on the fore-part; crown recurved; ½ inch long. European and Barbary coaſts, Devonſhire.

fiſſurella. * 196. P. grooved and perforated on the fore-part; crown recurved; 3½ lines long. Iceland ſeas, Falmouth harbour.

puſtula. 197. P. oval, gibbous, convex, with reticulated ſtriæ; margin crenated; perforation near the poſterior margin. Mediterranean and Indian ſeas.

græca. * 198. P. ovate, convex, reticulated; crown not much elevated; perforation oblong; margin crenulated; length ¾ inch. Foreign ſpecimens 1½ inch. European ſeas, Sandwich.

nimboſa. 199. P. ovate, ſtriated, rugged, brown; perforation oblong; 2 inches long. Mediterranean and Atlantic.

nubecula. 200. P. ſubovate, rugged, white radiated with red; perforation ovate. Mediterranean.

picta. 201. P. ovate, ſolid, clouded white and green, with oblique, undulated, alternate, violet and white rays; 3½ inches long. Straits of Magellan.

barbadenſis. 202. P. oblong, unequally ſtriated; within ſmooth; milk-white with greeniſh bands; margin crenated; perforation circular, and ſurrounded with a cheſnut ring. Barbadoes.

jamaicenſis. 203. P. whitiſh, tranſverſely annulated with longitudinal ſtriæ; covered with foliaceous tubercles; perforation oblong. Jamaica and Barbadoes.

caffra. 204. P. ovate, compreſſed, ſtriated; finely annulated, and radiated with black; bottom milk-white; perforation nearly central.

perforata. 205. P. a little convex, tranſverſely wrinkled; browniſh, with ſtraw-coloured rays and ſpots; ſtriæ longitudinal, and alternately larger and ſcaly; 1½ inch long.

porphyrozonias. 206. P. oblong, compreſſed, unequally ſtriated; white, with 5 purple, interrupted belts; greeniſh white within; perforation minute, ſurrounded on the inſide with a red circle. North America.

roſea. 207. P. thinly ſtriated with alternate roſy and white rays; perforation oval, and ſurrounded with a red ring on the inſide. Minute.

ſcutellum. 208. P. repand on each ſide, compreſſed; perforation radiated with grooves; from 1 to 1½ inch long.

avellana. 209. P. thin, white, and finely ſtriated; perforation oblong, and divided by a ligament.

ſpinoſa. 210. P. ovate, convex, white; ſtriæ elevated, thicker towards the margin, and marked with four rows of tubercles; exterior tubercles ſpinous; perforation oblong.

denticulata. 211. P. ovate, gibbous; whitiſh, radiated with brown; green within; ſtriæ elevated, ſomewhat rugged, and alternately larger; margin denticulated; crenated within; perforation in form of a parallelogram.

noduloſa. 212. P. ovate, convex; ſtriæ elevated, knotty, croſſing thinner tranſverſe ones; within white; crown black.

anguſta. 213. P. depreſſed, white; ſtriæ elevated, every 4th of which is larger; perforation narrow, ſurrounded with a cheſnut band on the outſide, and a green one within; ¾ inch long.

inæqualis. 214. P. ovate, convex; ſtriæ decuſſated; perforation ſurrounded with an elevated ring and red line; 1 inch long.

minuta. 215. P. oval, pyramidal, reddiſh, with 12 elevated white ſtriæ; bottom white; perforation oval and nearly central.

conſperſa. 216. P. ovate, convex, ſtriated; yellowiſh, with red dots and 3 oblique rays; crown central; perforation linear.

rubeſcens. 217. P. oval, ſtriated, reddiſh, with a white band in the middle; margin entire; perforation linear; 1 inch long.

ſanguinea. 218. P. oval, thin, red; within greeniſh white; ſtriæ longitudinal, croſſing finer tranſverſe ones, which are rugged outwardly; ½ inch long.

ventricoſa. 219. P. oval, ventricoſe, with red decuſſated ſtriæ; crown depreſſed; perforation orbicular; an inch long.

triradiata. 220. P. oval, flattiſh, ſtriated; white, with 3 brown rays; crown central; perforation linear; ½ inch long.

tenuis. 221. P. pellucid, oval, a little convex; longitudinally ſtriated; white, with 5 half brown rays; perforation with a cinereous margin; not ½ inch long.

melanozonias. 222. P. convex, roſy, with an interrupted black band, and elevated, unequal, white ſtriæ; crown pointed; perforation orbicular, and ſurrounded within with an elevated gray ring; 1¼ inch long.

223. P.

effuſa. 223. P. convex, roſy, with elevated, knotty, white, and alternately larger ſtriæ; perforation round and large; $1\frac{1}{2}$ inch long.

punicea. 224. P. convex, cheſnut; ſtriæ unequal, crowded, decuſſated; within ſmooth, with alternate green and white bands; perforation round, ſurrounded with a cheſnut ring, and an elevated white one within; above an inch long.

rufeſcens. 225. P. convex, white ſhaded with red; here and there ſtriated with red; within ſmooth, white; perforation oval.

dimidiata. 226. P. convex, above clear white, and cancellated; longitudinally ſtriated towards the margin, with a roſy band; perforation orbicular; an inch long.

lactea. 227. P. convex, white; ſtriæ glabrous, acute, unequal; crown roſy; perforation large, orbicular; an inch long.

pyramidalis. 228. P. convex, roſy, ſtriated; ribs 12, ſmooth; within ſmooth, and greeniſh white; one and one-fourth of an inch long.

bicolor. 229. P. narrow, alternately radiated with cheſnut and white; ſtriæ unequally thick, lamellated; margin inflected; perforation oblong; $1\frac{1}{4}$ inch long.

erythrocephala. 230. P. convex, white, with red lines outwardly, and elevated, rugged, contrary ſtriæ; 10 of them larger; margin repand, inflected; crown reddiſh; $1\frac{1}{4}$ inch long.

verrucoſa. 231. P. above brown, ſtriated, terminated by a knotty belt; beneath radiated with red, with acute, knotty ribs; perforation orbicular; three-fourths of an inch long.

contaminata. 232. P. convex, with nodulous, unequal ribs; larger ones yellowiſh brown, and marked with black dots, diſpoſed in interrupted circles; crown cinereous; perforation ſurrounded within with an elevated, graſs-coloured ring, and a brown circle.

atrata. 233. P. a little convex, narrow, white, with red lines; outwardly ſpotted with black, with elevated, convex, unequal ſtriæ; perforation oblong, with a cheſnut margin within, with a reddiſh ring; $\frac{3}{4}$ inch long.

candicans. 234. P. white, cheſnut towards the margin, with 20 alternately larger ribs; crown reddiſh, with an oblong perforation; near an inch long.

ſuccincta. 235. P. ovate, pointed, white; above ſmooth, with an elevated belt in the middle; dotted with ferruginous towards the margin; with elevated, unequal, ſmooth ſtriæ; perforation narrow, orbicular; $\frac{3}{4}$ inch long.

puſilla. 236. P. flattiſh, white, ſuborbicular, with 20 elevated, alternately leſs and ſhorter ſtriæ, perforation round, and ſurrounded on each ſide with a reddiſh circle; $\frac{1}{2}$ inch long.

flaveſcens. 237. P. thin, effuſe, pointed, finely ſtriated, yellowiſh, with 6 brown rays; crown cinereous; perforation oblong.

antiquata. 238. P. convex, obſoletely ſtriated, and furniſhed with concentric, imbricated wrinkles; perforation oval, or nearly round; $\frac{1}{2}$ inch diameter.

galeata. 239. P. ſolid, ovate, compreſſed; within white; crown a little recurved, and obtuſe; perforation linear; 6 lines long.

perſonata. 240. P. convex, with decuſſated lines and black rays. Falkland iſlands.

Gen. 33. DENTALIUM, *Tooth-ſhell.*

Gen. Char.—The animal a terebella; ſhell univalve, tubular, ſtraight or ſlightly curved, with an undivided cavity open at both ends. 61 Dentalium.

SPECIES.

1. D. with 10 ribs, ſlightly curved and ſtriated; 4 inches long. Indian and European ſeas. *elephantinum.*

2. D. with 10 ribs, ſmooth, and ſlightly curved. Indian ſeas. *aprinum.*

3. D. ribbed, curved, ſubulate, of one colour, greeniſh. *arcuatum.*

4. D. with 8 ribs and 8 ſtriæ, pointed; green, tipped with white. Sicilian ſeas. *ſtriatulum.*

5. D. ribs 6, ſtriated. Found foſſil at Loretto. *ſexangulum.*

6. D. with 20 ſtriæ, ſlightly curved, interrupted; red, tipt with white. Mediterranean. *dentalis.*

7. D. finely ſtriated, ſlightly curved; gray, with darker bands; thickneſs of a crow quill. Sicily. *faſciatum.*

8. D. ſtraight, doubly or triply ſtriated, and annulated. *rectum.*

9. D. roundiſh, ſomewhat obtuſe; finely and equally ſtriated. Foſſil near Loretto. *foſſile.*

10. D. round, obliquely ſtriated. Found foſſil. *annulatum.*

11. D. ſlightly curved, ſomewhat obtuſe; ſtriæ decuſſated, longitudinal ones granulated; an inch long. Found foſſil in Piedmont. *radula.*

12. D. ſtriæ decuſſated, all of them ſmooth; longitudinal ſtriæ with finer interrupted ones. Found foſſil in Piedmont. *interruptum.*

13. D. round, ſlightly curved, continued, with crowded, annular ſtriæ; $1\frac{1}{2}$ inch long. Indian and European ſeas. *politum.*

14. D. white, ſmooth, round, ſlightly curved, with remote rings. India. *eburneum.*

* 15. D. round, ſlightly curved; ſmooth, gloſſy tapering to a ſmall point; pervious; $1\frac{1}{2}$ inch long. Indian and European ſhores; weſtern coaſts of England. *entalis.*

16. D. round, curved, continued and ſmooth. Scandinavia. *arietinum.*

17. D. round, ſlightly curved, interrupted, opaque; $1\frac{1}{4}$ inch long. African ocean. *corneum.*

18. D. curved, very ſmooth, white, with fulvous clouds and ſpots. Sicily. *nebuloſum.*

19. D. horny, flexile, ſtraightiſh, round and ſmooth; $2\frac{1}{4}$ inches long. North ſeas. *pellucidum.*

20. D. hyaline, glabrous, ſlightly curved, and tapering gradually; $\frac{3}{4}$ inch long. Found foſſil in Piedmont. *vitreum.*

21. D. round, ſtraightiſh, ſmooth, minute; not larger than a briſtle. Mediterranean. *minutum.*

* 22. D. white, opaque, tranſverſely ſtriated and imperforated; minute. Sandwich, Falmouth harbour. *imperforatum.*

* 23. D. ſubpellucid, ſubarcuated, tapering to a ſmall point; pervious, contracting a little towards the larger end; white, gloſſy, and ſmooth. Britiſh channel; called by the mariners *hake's-tooth*. It is frequently brought up with the ſounding line. *gadus.*

* 24. D. ſubcylindrical, arcuated, marked with regular, ſtrong, tranſverſe ſtriæ; aperture round, tapering *trachea.*

to the other extremity, which is cloſed; ⅛ inch long; reſembles the trachea of an animal. Milton, Devonſhire. Rare.

glabrum. * 25. D. cylindric, arcuated, ſmooth, gloſſy, without ſtriæ or wrinkles; aperture orbicular; the other end cloſed, rounded; length one line. Devonſhire coaſt. *Montagu, Teſt. Brit.* p. 497.

62 Serpula.

Gen. 34. SERPULA.

Gen. Char.—The animal a terebella; ſhell univalve, tubular, generally adhering to other ſubſtances; often ſeparated internally by entire diviſions at unequal diſtances.

SPECIES.

nautiloides. * 1. S. flattiſh, minute, confluent, verrucoſe, ſpiral, with very thin, internal, ſemilunar diviſions. Seas of Norway, and on the byſſus of the *pinna ingens* on the coaſt of Devonſhire.

ſeminulum. 2. S. regular, oval, looſe, glabrous, not larger than a grain of ſand. Adriatic and Red ſeas; and is ſometimes found foſſil.

planorbis. 3. S. orbicular, regular, flat, equal; reſembles a round ſcale; adheres to ſhells.

ſpirillum. * 4. S. regular, ſpiral, orbicular; whirls round, gradually decreaſing. Found in the ocean, on zoophytes, on the *corallina officinalis* from Milton rocks, Devonſhire.

ſpirorbis. * 5. S. regular, ſpiral, orbicular; whirls ſlightly channelled above and inwardly, and diminiſhing gradually towards the center. Found in moſt ſeas, adhering to *fuci*. Shores of Britain.

triquetra. * 6. S. ſtrong, opaque, irregularly twiſted and contorted; triangular; ½ to 1 inch long. Found in the ocean, adhering to marine ſubſtances, ſtones, and the bottoms of ſhips. Coaſts of Britain.

intricata. * 7. S. filiform, rough, and intricately twiſted; greeniſh white, a little rugged and coarſe. European and Indian ſeas; ſhores of Britain, on ſhells.

filograna. 8. S. capillary, faſciculated, unbranched complications, and cancellated; forms a beautiful kind of network; 4 inches long. Mediterranean.

granulata. 9. S. round, ſpiral, glomerated; 3 elevated ribs on the upper ſide; ſize of a coriander ſeed. North ſeas, in maſſes adhering to ſhells and ſtones.

contortuplicata. * 10. S. angular, rugged, and irregularly entwined; tranſverſely ſtriated; 3 to 4 inches long. European and American ſeas; ſhores of Britain.

glomerata. 11. S. round, glomerated, with decuſſated wrinkles. European and Atlantic ſeas.

lumbricalis. 12. S. round, flexuous, with a ſpiral, acute tip; tranſverſely ribbed, and longitudinally wrinkled; 3 to 5 inches long. Atlantic and Indian ſeas, in large maſſes.

polythalamia. 13. S. round, diaphanous, ſmooth, ſtraightiſh, with numerous internal diviſions. Mediterranean and Indian ſeas, under the ſands.

arenaria. 14. S. jointed, entire, diſtinct, flattiſh beneath. India and Africa.

anguina. 15. S. roundiſh, ſomewhat ſpiral, with a longitudinal, jointed cleft. Indian ocean.

vermicularis. * 16. S. round, tapering, curved, wrinkled; 2 to 3 inches long. European ſeas; coaſts of Britain.—The animal which inhabits this ſhell is of a bright ſcarlet colour, and is furniſhed with elegant feathered tentacula, from the midſt of which ariſes a trumpet-ſhaped tube, and a leſſer ſimple one.

penis. 17. S. *Watering-pot*; round, ſtraight, taper, with a dilated, radiated, larger extremity; the diſc is covered with cylindrical pores; 3 to 5 inches long. Indian ocean.

echinata. 18. S. roundiſh, flexuous, roſy, with numerous rows of prickles, obtuſe at the end; aperture margined; ſize of a crow quill.

ocrea. 19. S. brown, roundiſh, ſtriated. Indian ocean, adhering to corals.

protenſa. 20. S. poliſhed, ſmoothiſh, with annulated plaits, a little tapering towards the end; ſize of a quill. Indian and American ſeas.

decuſſata. 21. S. round, with decuſſated ſtriæ, ſlightly wrinkled, flexuous, red; within ſmooth, white.

proboſcidea. 22. S. ſmooth, white, the broader part ſtraight, and tranſverſely plaited; 2 to 4 inches long.

afra. 23. S. ſubſtriated, yellowiſh brown, round, twiſted into 3 whirls, with a central tip.

cereolus. 24. S. long, narrow, round, ſmooth, yellowiſh; many times twiſted. America.

cornucopia. 25. S. conic, ſpirally twiſted, yellowiſh, with brown bands; the middle round and twiſted; aperture orbicular.

goreenſis. 26. S. round, cancellated, yellow, within horny; 8 to 9 inches long. Goree.

inteſtinalis. 27. S. triangular, twiſted, tuberculated, with hollow dots; 8 to 9 inches long. Africa.

infundibulum. 28. S. round, white, tranſverſely ſtriated, and thrice twiſted; the firſt turn ſeemingly compoſed of 5 funnels placed in each other. Indian ocean; fixed to ſtones.

pyramidalis. 29. S. cinereous, convex above, beneath flat; pyramidal, and many times twiſted; an inch long; open at the narrower end. Indian ſea.

denticulata. 30. S. white, round, ſubulate, ſtraight, and toothed at the ſides; with a longitudinal, glabrous rib in the middle; tip glabrous, a little incurved; ¾ inch long. Found in the lepas tintinnabulum.

melitenſis. 31. S. roundiſh, twiſted, umbilicated, with decuſſated ſtriæ, and longitudinal, knotty ribs; within ſmooth, with numerous diviſions. Found foſſil in Malta.

norwegica 32. S. round, ſmooth, incurved; baſe nearly obſolete, undulated; mouth obliquely truncated. Norway.

porrecta. 33. S. round, ſmooth, poliſhed, aſcending in a flexuous manner from the ſpire or baſe.

vitrea. * 34. S. round, regular, ſpiral, orbicular, wrinkled, with a thickened aperture. Greenland ſeas; ſhores of Britain.

cancellata 35. S. ſpiral, glomerated, with three grooves, the lower interrupted by tranſverſe ribs; aperture 2-toothed. Greenland ſeas.

ſtellaris. 36. S. ſub-orbicular, umbilicated, convex, radiated with wrinkles. Greenland ſeas.

gigantea. 37. S. ſomewhat triangular, and a little flexuous, gradually tapering, violet; within ſmooth and pale yellow; aperture white, with undulated ſtriæ, and armed with a conic tooth; a foot high, and as thick as the little finger. Africa and America.

cinerea. 38. S. filiform, glabrous, conglomerated, perforated. Shores of Maſſilia.

39. S.

ſulcata. * 39. S. whirls 2, deeply and ſpirally grooved; greeniſh, minute. Coaſt of Pembrokeſhire, on the roots of fucus digitalis.

ovalis. * 40. S. ſuboval, with 2 bends, imperforated, minute. Found at Denbigh.

reflexa. * 41. S. regular, rounded; margin reflected at the aperture; minute. Pembrokeſhire ſands.

cornea. * 42. S. regular, rounded, pellucid, with 3 whirls; horny. Pembrokeſhire coaſt.

bicornis. * 43. S. ſemilunar, ventricoſe, white, opaque, gloſſy; minute. Sandwich and Reculver.

perforata. * 44. S. white, opaque, gloſſy; ſemilunar and perforated; minute. Sandwich. Rare.

lactea. * 45. S. oval, thin, ſmooth, pellucid, with milky veins; minute. Sandwich; very rare.

lagena. * 46. S. round, ſtriated, grooved, with a narrow neck, like an oil flaſk; minute. Sandwich and Sheppey.

retorta. * 47. S. rounded, margined, with a ſlender recurved neck. Sandwich; rare.

incurvata. * 48. S. ſtraight, with 3 cloſe whirls at the ſmaller end; minute. Sandwich.

63 Teredo.

Gen. 35. Teredo.

Gen. Char.—The animal is a terebella, with two calcareous, hemiſpherical valves, cut off before, and two lanceolate ones; the ſhell tapering, flexuous, and penetrating wood.

Species.

navalis. 1. T. *Ship-worm;* ſhell thin, cylindrical, ſmooth; more or leſs twiſted; rather obtuſe at the tip; 4 to 6 inches long.

At the ſmaller end the ſhell becomes thick and ſtrong, and is furniſhed within with plaits or laminæ, which contract that part, leaving a very ſmall opening. The anterior valves attached to the head of the animal, are of a hemiſpherical form, one half of the front projecting in a ſharp angle, and ſomewhat pointed. The inſide of each valve is white, furniſhed with a long, flat, curved tooth, projecting inwards, under the hinge, and a ſhort lateral tooth at the extremity of the hinge, correſponding in each valve. The margin oppoſite the hinge runs to an acute angle, at the point of which, in each valve, is a ſmall knob, which comes in contact when the valves are brought together. Near the extremity of the tail there are two valves, one on each ſide; a little concave on the inſide, and rounded at the end. By their means the extremity of the tube at the thickened part is cloſed. Theſe are properly to be conſidered as the ſhell of the animal, becauſe they are attached to it. The tube, or teſtaceous ſheath, which lines the hole made in the wood, appears only to be formed as an apartment, in which the animal may move with more eaſe; for it is found that two tubes never come in immediate contact with each other, although the fibres of the wood between them are frequently no thicker than paper. This tube is ſeldom ſo long as the animal; the internal part of the perforation is uſually not lined with it for the ſpace of 2 inches, and ſometimes more; but the ſmaller end is always even with the ſurface of the timber which is perforated; but ſo ſmall, as not eaſily to be diſcovered, yet it is ſufficient to admit the water, which is regulated by the poſterior valves of the animal.

It is found in the ſides and bottom of ſhips, and even the ſtrongeſt oak, which has been ſome time under water. This teſtaceous animal was originally a native of the warmer climates, and was brought to Europe, where it has been produced, and has proved extremely deſtructive to the bottoms of ſhips, and to works conſtructed of wood, which remain for ſome time conſtantly under water. It appears, from ſome piles of ſolid oak which were examined in the dock-yard of Plymouth, and which had remained under water for about four or five years, that the deſtructive effects of theſe animals are very great in that time; for theſe piles were found to be greatly perforated, which rendered it neceſſary to remove them, and replace them with others. The bottoms of ſhips which frequent warm climates, it is well known, are ſheathed with copper, to ſecure them from the effects of theſe deſtructive animals. But the method which is adopted about the dock-yards to preſerve the timbers which are conſtantly under water, is to cover them with broad-headed nails; which, by the effects of the ſea water are ſoon incruſted with a coating of ruſt, which is found to be impenetrable to the ſhipworm.

It has been obſerved that the *teredo navalis* cuts acroſs the grain of the wood as ſeldom as poſſible. After it has penetrated a little way, it turns and continues with the grain, till it meets with another ſhell, or a knot in the wood. The courſe which it then takes is regulated by the nature of the obſtruction. If this be conſiderable, it makes a ſhort turn back in the form of a ſyphon, rather than continue for any diſtance acroſs the grain.

utriculus. 2. T. ſolid, cylindrical, undulated; 7 inches long. In wood.

clava. 3. T. clavated at one end, incurved at the other; narrower, obtuſe and perforated in the middle; 2 inches long. Found in the ſeed-veſſels of the xyloſteum granatum.

64 Sabella.

Gen. 36. Sabella.

Gen. Char.—The animal a nereis, with a ringent mouth, and two thicker tentacula behind the head; ſhell tubular, compoſed of particles of ſand, broken ſhells, and vegetable ſubſtances, united to a membrane by a glutinous cement.

Species.

ſcrupoſa. 1. S. ſolitary, looſe, curved, with lentiform, gloſſy granulations; thickneſs of a ſwan's quill. India and American iſlands.

ſcabra. 2. S. ſolitary, fixed by the baſe, ſimple, curved, with radiated, rough granulations. America.

alveolata. * 3. S. numerous, parallel tubes, communicating by an aperture, forming in the maſs the appearance of honey combs; 2 to 3 inches long. European coaſts, Britain.

chryſodon. * 4. S. ſolitary, ſubcylindrical, papyraceous, chiefly compoſed of fragments of ſhells, thickneſs of a quill; 2 to 6 inches long. European and Indian ſeas, ſhores of Britain.

belgica. * 5. S. ſtraight, conic, compoſed of minute particles of ſand; 2 to 3 inches long. European coaſts, ſhores of Britain.

rectangula. 6. S. brown, with alternate white and black rings; ſtraight, with a rectangular gibbous extremity; 9 inches long.

capenſis. 7. S. cylindrical, conic, open at both ends; membranaceous; rough, with interrupted, tranſverſe ſtriæ. Cape of Good Hope.

nigra. 8. S. cylindrical, black, ſmoothiſh on the outſide; compoſed of minute particles of ſand; $\frac{1}{2}$ inch long. Rivulets of Thuringia.

ſtagnalis. 9. S. ſtraight, tapering, open at both ends; ſmooth, with a margined aperture, compoſed of very minute particles of ſand. Rivers of Thuringia.

conica. 10. S. narrow, conic, ſmooth, ſtraight, cinereous; with a blackiſh open tip, compoſed of very minute particles of ſand; not $\frac{1}{2}$ inch long.

uncinata. 11. S. ſmooth, round, tapering, with an open hooked tip; $\frac{1}{4}$ inch long. Rivers of Thuringia.

ſabuloſa. 12. S. cylindrical, cloſed at the tip, ſubclavated, perforated, and compoſed of larger grains of ſand; not an inch long. Thuringia and Belgium.

vegetabilis. 13. S. depreſſed, compoſed of fragments of twigs, ſtems and bark, and broken pieces of the tellina cornea; an inch long. Waters of Thuringia.

ammoniata. 14. S. polygono-cylindrical, within ſmooth, compoſed of fragments of cornu ammonis. Rivers.

helicina. 15. S. round, within ſmooth, compoſed of fragments of the helix puſilla; an inch long. Stagnant waters of Thuringia.

dimidiata. 16. S. one part of the ſhell compoſed of ſand or gravel, the other thicker, clavated, and compoſed of fragments of ſhells. Waters of Thuringia.

fixa. 17. S. compoſed of ſmall ſtones; tapering towards the tip; an inch long; affixed to ſtones in the water, and open at the ſide by which it is fixed. Thuringia.

clavata. 18. S. compoſed of ſmall ſtones the open end clavated, and conſiſting of larger ſtones; ſolitary. Thuringia.

corticalis. 19. S. compoſed of pieces of bark, towards the end of broken ſtems.

arundinacea. 20. S. ſubconic, open at both ends, compoſed of fragments of the bark of reeds, placed on each other; an inch long.

aculeata. * 21. S. compoſed of ſmall twigs, the points of which project a little; an inch long. Thuringia, Britain.

marſupialis. 22. S. black; open end cylindrical and narrower, the other part tinged and ovate; 2 inches long.

norwegica. 23. S. roundiſh, open at both ends, brittle, membranaceous; compoſed of very minute grains of ſand; 4 inches long. Norway.

lumbricalis. 24. S. coarſe, creeping, fragile, open at both ends; the animal not furniſhed with tentacula at the mouth; body pricky, jointed. Deeps of the Greenland ſeas; fixed to ſtones.

indica. 25. S. cylindrical, compoſed of capillary, ſubcylindrical, agglutinated cryſtals of quartz. Indian ocean.

arenaria. * 26. S. extremely fragile, cylindrical, compoſed of pure ſand, ſlightly cemented together, without any internal membrane; ſize of a raven's quill; from 1 to 2 inches long. Dorſetſhire coaſt. *Montagu.*

ſubcylindrica. * 27. S. long, ſubcylindric, ſlender, fragile, compoſed of fine ſand, and minute bits of broken ſhells, cemented together on a fine membrane; 3 inches long. Salcomb-bay. *Montagu.*

ſetiformis. * 28. S. long, ſlender, gradually tapering to the lower end, compoſed of fine fragments of ſhells, and minute flat bits of ſtones, cemented together at their edges; 3 to 4 inches long. Salcomb bay.—Some have been obſerved with a lateral branch near the ſmaller end, which is ſuppoſed to be a young one. *Montagu.*

curta. * 29. S. ſmall, ſhort, compoſed of ſand and minute bits of flat ſtones, agglutinated to a tough membrane; ſize of a crow quill; an inch long. Inlet near Kings-bridge. This ſabella is gregarious, covering the whole ſurface of the ſhore, appearing like bits of ſtraw covered with mud. *Montagu.*

compreſſa. * 30. S. ſhort, broad, and very flat, compoſed of large fragments of flat, bivalve ſhells, placed with the concave ſide inwards; $1\frac{1}{2}$ inch long. Deeps at Torcroſs, Devonſhire.

65 Enumeration of the ſpecies.

Number of Species included under each Genus, in the preceding Claſſification.

Genera	Species	
I. MULTIVALVES.		
1. Chiton,	29	
2. Lepas,	33	
3. Pholas,	12	
		74
II. BIVALVES.		
4. Mya,	31	
5. Solen,	24	
6. Tellina,	94	
7. Cardium,	52	
8. Mactra,	27	
9. Donax,	21	
10. Venus,	152	
11. Spondylus,	4	
12. Chama,	25	
13. Arca,	43	
14. Oſtrea,	136	
15. Anomia,	51	
16. Mytilus,	65	
17. Pinna,	18	
		743
III. UNIVALVES.		
18. Argonauta,	5	
19. Nautilus,	34	
20. Conus,	71	
21. Cyprea,	120	
22. Bulla,	57	
23. Voluta,	144	
24. Buccinum,	200	
25. Strombus,	53	
26. Murex,	180	
27. Trochus,	131	
28. Turbo,	152	
29. Helix,	267	
30. Nerita,	76	
31. Haliotis,	19	
32. Patella,	240	
33. Dentalium,	25	
34. Serpula,	48	
35. Teredo,	3	
36. Sabella,	30	
		1855
Total number of ſpecies,		2672

Species of Shells which have been found in the Foſſil State.

Lepas Anſerifera.
66 Cardium Lithocardium. Only found foſſil.
Found foſſil. Venus Caſſina.
——— Mercenaria. Mountains of Sweden.
——— Imbricata. France.
Chama Foliacea. Campania.
Arca Foſſilis. Limbourg.
——— Nucleus.
Ostrea Diluviana. Sweden.
——— Mytiloides. Alſace.
——— Torta. Alſace.
Anomia Craniolaris.
——— Gryphus.
——— Pecten.
——— Striatula. Exiſts only foſſil.
——— Reticularis.
——— Plicatella. Only foſſil.
——— Criſpa. England and Switzerland.
——— Lacunoſa. Only foſſil.
——— Cuſpidata. Derbyſhire.
——— Farcta. Switzerland.
——— Terebratula.
——— Angulata.
——— Hyſterita. Germany.
——— Biloba. Only foſſil.
——— Spinoſa. England.
——— Dorſata.
——— Sandalium. Germany.
Nautilus Helicites.
——— Lituus.
——— Orthocera.
——— Belemnita.
Voluta Foſſilis. Only foſſil.
Buccinum Foſſile. Germany.
——— Marginatum.
Strombus Spinoſus. Only foſſil.
——— Fiſſurella. Campania.
——— Siniſter. Foſſil only. Helvetia.
Murex Triacanthus.
——— Triptenus. Campania.
——— Coſtatus. Campania.
——— Lævigatus. Campania.
——— Foſſilis. Campania.
——— Campanicus. Campania.
Trochus Schrœteri. Campania.
Nerita Clathrata. Campania.
——— Perverſa. Only foſſil.
Haliotis Perverſa.
——— Plicata.
Patella Echinata.
Dentalium Sexangulum. Loretto.
——— Foſſile. Loretto.
——— Annulatum.
——— Radula. Piedmont.
——— Interruptum.
——— Vitreum. Piedmont.
Serpula Seminulum.
——— Melitenſis. Malta.

CHAP. V. OF THE CONSTITUENT PARTS OF SHELLS, &c.

HAVING in the former chapter enumerated, under each genus, all the ſpecies of teſtaceous animals which have been hitherto diſcovered; and having given the characteriſtic marks by which each is diſtinguiſhed, which marks are derived from the ſhell or teſtaceous covering; we now propoſe to inquire what is the nature of this ſubſtance; in what way it is produced by the animal, and how it is enlarged as the animal increaſes in ſize. Theſe topics ſhall be the ſubject of the preſent chapter, which may be conveniently divided into the following ſections. 1. Of the conſtituent parts of ſhells. 2. Of their formation. 3. Of the colours of ſhells. 4. Of the formation of the umbilicus and protuberances, &c. 5. Of the pearl.

Sect. I. *Of the Conſtituent Parts of Shells.*

The nature and component parts of teſtaceous ſubſtances have been particularly inveſtigated by Mr Hatchett, from whoſe paper we extract the following obſervations. *Phil. Tranſ.* 1799.

67 Diviſions of ſhells from their component parts. In his examination of marine ſhells, Mr Hatchett found, from the nature of the ſubſtance of which they are compoſed, that they might be arranged in two diviſions. Under the firſt are included thoſe which have a porcellaneous appearance and enamelled ſurface, and exhibit, when broken, ſomething of a fibrous texture. The other diviſion is diſtinguiſhed, by having a ſtrong epidermis or covering, under which is the ſhell, compoſed principally or entirely of mother-of-pearl. To the firſt diviſion belong different ſpecies of voluta, cypræa, and others. The ſecond comprehends the oyſter, the river muſſel, and ſome ſpecies of haliotis and turbo.

68 Porcellaneous. *Porcellaneous ſhells.*—The ſhells of this deſcription which were examined, were different ſpecies of voluta and cypræa. When they were expoſed to a red heat for a quarter of an hour, they crackled, and loſt the colours of their enamelled ſurface. No apparent ſmoke, and no ſmell, like that of burnt horn or cartilage, were emitted during the proceſs. The figure remained the ſame, excepting a few flaws; and they became of an opaque white, partially tinged with pale gray. When they were diſſolved in acids, after being burnt, they depoſited a ſmall quantity of animal coal, which proves that they contain ſome portion of gluten. Shells which had not been expoſed to the fire, diſſolved with great effervеſcence in the different acids; and the ſolution remained tranſparent and colourleſs; from which it appears, that the proportion of gluten is ſmall, ſince it could not to be traced in the ſolution of the unburnt ſhells.

In examining the different ſolutions of ſhells, whether burnt or unburnt, by chemical teſts, it was found, that no trace of phoſphate of lime, or of any other combination of phoſphoric acid, exiſted in theſe ſubſtances. And it appeared from many experiments, that the component parts of porcellaneous ſhells, are carbonate of lime, cemented with a very ſmall portion of animal gluten.

Some ſpecies of patella, which were brought from Madeira, were alſo ſubjected to chemical examination, by the ſame philoſopher. When expoſed to a red heat in a crucible, they emitted a perceptible ſmell of horn or feathers; and by farther examination, by ſolution, the proportion of carbonic matter depoſited appeared to be greater, and the proportion of carbonate of lime leſs, than what was indicated by the reſult of the experiments on porcellaneous ſhells. When unburnt ſhells belonging to the ſame ſpecies, were immerſed in nitric acid very much diluted, the epidermis ſeparated, and the whole of the carbonate of lime was diſſolved. A gelatinous ſubſtance, nearly in a liquid ſtate, remained, but it did not retain the figure of the ſhell, and exhibited no appearance of a fibrous ſtructure. Theſe ſhells, therefore, contain a larger portion of gelatinous matter than the porcellaneous ſhells, but the other component part conſiſts entirely of carbonate of lime.

69 Mother-of-pearl.

Shells compoſed of mother-of-pearl.—Shells of this deſcription were ſubjected to ſimilar experiments with the former. When the common oyſter was expoſed to a red heat, the effects were the ſame as thoſe which were produced by the ſame proceſs on the ſpecies of patella from Madeira. The ſolution of the unburnt ſhell was alſo ſimilar, excepting only that the gelatinous part was of a greater conſiſtency. When the river muſſel was burnt in a crucible, it emitted much ſmoke, with a ſtrong ſmell of burnt horn or cartilage; the ſhell became of a dark gray colour, and exfoliated. By ſolution in the acids, the proportion of carbonic matter ſeparated was greater, and that of carbonate of lime obtained was leſs, than from the other ſhells on which experiments were made.

When an unburnt ſhell of this deſcription was immerſed in diluted nitric acid, a rapid ſolution and efferveſcence took place; and at the end of two days, the whole of the carbonate of lime was nearly diſſolved. A ſeries of membranes now only remained, of which the epidermis conſtituted the firſt. Theſe membranes ſtill retained the figure of the ſhell. The carbonate of lime was at firſt readily diſſolved, becauſe the acid came eaſily in contact with it; but the proceſs became ſlower, as it was more difficult for the acid to inſinuate itſelf between the different membranes of which the ſhell is compoſed. The haliotis iris, and the turbo olearius, were found to reſemble this muſſel, except that the membranaceous parts were more compact and denſe.

When theſe ſhells are deprived by an acid of the carbonate of lime, which gives them their hardneſs, they appear to be formed of different membranes, applied ſtratum ſuper ſtratum. Each membrane is furniſhed with a correſponding coat or cruſt of carbonate of lime, and it is ſo ſituated, that it is always between every two membranes, beginning with the epidermis, and ending with the internal membrane, which has been laſt formed. The animals which inhabit theſe ſtratified ſhells, increaſe their habitation by the addition of a ſtratum of carbonate of lime, which is ſecured by a new membrane. And as every additional ſtratum exceeds in extent that which was previouſly formed, the ſhell becomes ſtronger in proportion as it is enlarged; and thus the growth and age of the animal may be denoted by the number of ſtrata of which the ſhell is compoſed. Similar experiments were made on pieces of mother-of-pearl as they are imported from China, and with preciſely the ſame reſults. They appeared to be compoſed of the ſame gelatinous matter and carbonate of lime. In all the ſhells of this deſcription which were immerſed in acids, the membranaceous parts retained the exact figure of the ſhell, and they appeared diſtinctly to be compoſed of fibres, arranged in a parallel direction, correſponding to the configuration of the ſhell.

70 Pearl.

Pearl.—The conſtituent parts of pearl appear to be ſimilar to thoſe of mother-of-pearl. They are compoſed of concentric coats of membrane and carbonate of lime, and reſemble in ſtructure the globular, calcarcous concretions which are known by the name of *piſolithes*. The irideſcence and undulated appearance of pearl and mother-of-pearl, evidently depend on their lamellated ſtructure and ſemitranſparency.

71 Component parts.

From theſe experiments it appears, that ſhells are compoſed of carbonate of lime and gluten. In ſome, as in the porcellaneous ſhells, the proportion of carbonate of lime is great, while that of the animal matter is ſmall; and theſe may be regarded as the beginning of the ſeries; while ſhells that come under the deſcription of mother-of-pearl are to be placed at the other extremity, having a ſmaller proportion of carbonate of lime, and a greater proportion of membranaceous ſubſtance. In the firſt the carbonate of lime is merely cemented by the animal matter; in the latter the carbonate of lime ſerves to harden the membranaceous ſubſtance. But between theſe two extremes, in the proportion of carbonate of lime and animal gluten, of which all teſtaceous ſubſtances are compoſed, there are no doubt numerous intermediate gradations, ariſing from the nature of the animal to which they form a covering, its peculiar habits, or mode of life.

SECT. II. *Of the Formation of Shells.*

THE ſhell or covering of teſtaceous animals, has been conſidered as in ſome meaſure analogous to the bones of other animals, although its formation and growth are very different, ſince it ſerves as a baſe or ſupport to the muſcles, which are attached to its internal ſurface. The principal uſe of the ſhell, however, is to ſerve as a covering or defence to the animal.

72 Teſtaceous animals oviparous and viviparous.

Teſtaceous animals are not only extremely different in external form, but alſo in the mode of their production. Some are viviparous, as the moſt of thoſe which inhabit bivalve ſhells, multivalves, and even ſome of the univalves; while the others, which form the far greater proportion, are oviparous. In one point, however, they all agree, that whatever be the mode of production, whether from an egg, or directly from the uterus of the mother, the ſhell is formed on the body of the young animal, and is proportioned to its bulk.

73 Reaumur's inveſtigation.

The beſt obſervations which have yet been made, and the moſt elaborate inveſtigation which has hitherto appeared, concerning the formation and developement of ſhells, are thoſe of the celebrated Reaumur, which were publiſhed in the Memoirs of the Academy of Sciences for the year 1709. The ſame ſubject has been proſecuted by other authors, but their reſults have been nearly the ſame as thoſe of this diſtinguiſhed naturaliſt. Klein is almoſt the only author who has advanced a different opinion. In his diſſertation concerning the formation of ſhells, he charges Reaumur with ſupporting the opinion, that teſtaceous animals, when they proceed from eggs, are not furniſhed with the ſhell, but that it is formed after being hatched. This opinion indeed has been aſcribed to Reaumur by the hiſtorian of the academy, who, in the analyſis of his excellent memoir on the formation of ſhells, has obſerved, "that hitherto the curious have been ſtruck with the prodigious variety, the exact regularity of ſtructure, the ſingular beauty and ſplendour of colour of ſhells; but naturaliſts have been leſs attentive in ſtudying and inveſtigating the mode of their formation. They ſeem to have thought that although ſhells, as well as the covering of cruſtaceous animals, are bones placed externally to the animals which they cover, it was neceſſary to conſider them as part of their bodies, and to include this inexplicable circumſtance under that of the general formation of animals, which is incomprehenſible to the human mind. They have therefore ſuppoſed that the animal and its ſhell proceeded from the ſame egg, and were developed together; and they have reſted ſatisfied in admiring the economy of nature in providing ſo elaborate a covering for ſo low an order of animals. But this ſuppoſition, although probable, is not founded in truth. The animal only, not the ſhell, is produced from the egg. The diſcovery of this fact is owing to Reaumur."

74 His opinion miſtaken.

It muſt ſeem very extraordinary, that ſuch an error ſhould have crept into the abſtract of the memoir of this celebrated philoſopher, who in the courſe of it has clearly expreſſed a contrary opinion. "I have frequently," ſays Reaumur, "compared the ſhells of ſnails which were juſt hatched, and even thoſe which I had taken from the eggs before they were hatched, with other ſhells of full grown ſnails of the ſame ſpecies, with which I had left only the ſame number of whirls of the ſpire with the ſmall ſhells, and then they appeared in all reſpects the ſame." He farther obſerves, "that what has been ſaid with regard to the increaſe of ſhells, renders it unneceſſary to enter into the detail of their original formation; for it is eaſy to conceive, that when the body of a ſmall embryo which is one day to fill a large ſhell, has arrived at a certain ſtate, in which the different teguments in which it is included have ſufficient conſiſtence to ſecrete from their pores the peculiar fluid which is deſtined to the formation of the ſhell, this fluid may be depoſited on the ſurface, may thicken, and at laſt become firm and ſolid. And thus commences the formation of the ſhell, in the ſame way as its increaſe is continued. Snails do not proceed from the egg without being previouſly furniſhed with this ſhell, which then has one turn and a little more of the ſpire.

75 All teſtaceous animals furniſhed with the ſhell before being hatched.

When the eggs of teſtaceous animals are hatched, the young appears with its ſhell already formed, and according to the obſervation of Reaumur, it has then one complete turn of the ſpire and a little more; but at that period the ſhell is extremely thin. It ſeems probable that the formation of the ſhell is poſterior to that of the principal organs of the animal, as the bones in the fœtus of other animals are formed after the brain and heart.

76 Shell laſt formed.

Reaumur has ſuſpected that the ſhell is the laſt formed, and if proofs are wanting to eſtabliſh this fact, it is certain that at particular periods, if the eggs of teſtaceous animals are opened, the external parts of the embryo are found already developed, without any appearance of the ſhell. But whatever may be the period of the formation of the ſhell, it may be received as an eſtabliſhed fact, that the animal is furniſhed with it at the time it leaves the egg. Leeuwenhoek firſt obſerved this fact with regard to oyſters; the ſame obſervation was afterwards made by Liſter, and extended to others, both land and river ſhells. This obſervation has been confirmed by other naturaliſts, and particularly by Rumphius, Swammerdam, Reaumur, and Adanſon. From the inveſtigations of the latter it appears, that although there are many of the marine teſtaceous animals which are viviparous, they reſemble thoſe which are oviparous, in being furniſhed with the ſhell when they are ſeparated from the parent.

77 Two opinions of the formation of ſhells.

Since then it appears, that the ſhell of teſtaceous animals is completely formed previous to the developement of the animal, and that it may be conſidered as an eſſential part of its organization, let us now inquire into the mode by which its growth is effected. According to the deciſive experiments of Reaumur, the enlargement of ſhells is owing to juxta-poſition, or ſucceſſive additions of earthy and animal matter, independent of any organized ſtructure. Klein has ſupported a contrary opinion, and ſuppoſes that the growth of ſhells is effected by intus-ſuſception, or a kind of circulation. The opinion of Reaumur, however, has moſt generally prevailed. Excepting Bonnet, few naturaliſts have adopted that of Klein; and it will appear that this celebrated naturaliſt was led to entertain this opinion concerning the mode of the formation of ſhells, by the experiments of Heriſſant on the generation of bone and ſhell. From theſe experiments it was clearly demonſtrated, that ſhells are compoſed of two ſubſtances, the one a membranaceous or animal ſubſtance, and the other an earthy matter; but no ſuch concluſion can be drawn from them in ſupport of the opinion, that the ſhell is a continuation of the body of the animal, or that it is ſo cloſely connected as the bones in the bodies of other animals; or even that this connexion is formed by means of fibres of the ligament which attaches the animal to its ſhell: for it has been ſhown, that theſe muſcular or ligamentous fibres, in all deſcriptions of teſtaceous animals, are ſucceſſively ſeparated, in proportion to the increaſe or enlargement of the ſhell. This could not poſſibly take place, if the evolution and formation of the ſhell, according to the opinion of Heriſſant, depended on an internal circulation, analogous to what happens in the body of the animal. In this caſe the veſſels which proceed from its body, having no longer a communication with thoſe which are ſuppoſed to exiſt in the ſhell, it would be deprived of nouriſhment, and conſequently could not increaſe in ſize. And it is found, that this ſeparation takes place in all ſhells. It is gradually completed as the growth of the ſhell advances.

79 Bodies organized or inorganized.

A body may increaſe in volume in two different ways. Either the particles of which it is compoſed paſs through that body by means of circulation, and undergo certain changes by which they are prepared to form part of the body; or the particles of which a body is compoſed, may unite with it by juxta-poſition, without any previous circulation or preparation within the body, to the increaſe of which they are deſtined.

It is in the firſt way that the growth of vegetables and animals is accompliſhed.; the ſecond is the mode by which ſhells receive new additions of matter, and enlarge in ſize. The firſt is the mode of increaſe peculiar to living, organized ſubſtances; by the ſecond, inorganized ſubſtances receive new additions of matter, and increaſe in volume. Theſe indeed afford ſufficient characteriſtic marks for a natural diviſion of bodies into two claſſes, namely organized and inorganized ſubſtances.

79
Reaumur's experiments.

The experiments of Reaumur have deciſively proved, that the growth of ſhells is owing to the latter mode of increaſe. Theſe experiments were made, not only on ſea ſhells, but alſo on land and river ſhells; on univalves and bivalves; and in all, the reſult was invariably the ſame. In conducting theſe experiments, he incloſed the ſhells on the progreſs of which he made his obſervations, in boxes pierced with ſmall holes, ſo as to admit the water, but ſo ſmall as to prevent the egreſs of the animal. Theſe boxes were ſunk into the ſea, or the river, and in this way he was enabled to watch the proceſs of the growth of the ſhell. He firſt obſerved, that when the animal which exactly filled its ſhell began to increaſe its ſize, the ſhell in a ſhort time not being ſufficiently large to cover its whole body, part of it was naked or unprotected. This part of the animal muſt always be towards the opening of the ſhell, becauſe the ſhell being previouſly completely filled, it cannot extend in any other direction. All animals which inhabit ſhells of a ſpiral form, ſuch as the ſnail and volute, can only extend at the head, or the opening of the ſhell; whereas the animals in bivalve ſhells, ſuch as the muſſel and the oyſter, may enlarge in their whole circumference. In all the ſpecies of teſtaceous animals, it is this part which appears by the increaſe of the animal when it enlarges the ſhell. This increaſe takes place, according to Reaumur, by the following mechaniſm.

80
Proceſs of the formation of ſhell.

It is a neceſſary effect of the laws of motion, when liquids run in canals, that the ſmall particles of theſe fluids, or the ſmall foreign bodies mixed with them, which on account of their figure, or their leſs degree of ſolidity in proportion to their ſurface, move ſlower than the others, fly off from the centre of motion, and approach towards the ſides of theſe canals. It even frequently happens, that theſe ſmall particles attach themſelves to the internal ſurface of theſe canals or tubes, and form concretions of different degrees of thickneſs. It is beſides certain, that the fluids which circulate in theſe tubes, preſs againſt their ſides on every point of their interior ſurface; ſo that if they were pierced with a number of ſmall holes of ſufficient diameter to give paſſage to the ſmall particles of matter floating in theſe fluids, theſe particles would be depoſited on the external ſurface, where a cruſt would be formed, ſimilar to that in the inſide; with this difference, that it would become thicker and more ſolid, being leſs expoſed to the friction of the fluid, than that which is depoſited in the interior of the tube.

81
By ſecretion from the animal.

To a ſimilar mechaniſm Reaumur aſcribes the increaſe of ſhells. The external ſurface of that part of the body of the animal which has extended beyond the limits of the old ſhell, is furniſhed with a great number of canals, in which circulate the neceſſary fluids for the nutrition of the animal. A great many ſmall particles of a viſcid and earthy matter are mixed with theſe fluids. Now, as theſe particles are leſs fluid than thoſe of which the liquids themſelves are compoſed, they approach the ſides of the veſſels, which are themſelves furniſhed on that ſide of the external ſurface of the body of the animal, with a great number of pores, which allow them to eſcape from the veſſels, ſo that they are depoſited on the external ſurface of theſe tubes, or rather in that of the body of the animal itſelf, which is uncovered by the ſhell.

Theſe particles of earthy and viſcid matter having reached the ſurface of the body of the animal, readily unite with each other, and with the extremity of the old ſhell, eſpecially when the exceſs of moiſture is diſſipated; and thus by their union they compoſe a ſmall, ſolid body, which is the firſt layer of the new addition. Other particles of ſimilar matter continuing to eſcape in the ſame way from the excretory veſſels of the animal, form a ſecond layer under the firſt; afterwards a third, and a fourth, or more, till the new part of the ſhell has acquired ſufficient conſiſtence and thickneſs. It is, however, obſerved to continue thinner for a certain time than the former opening, till the increaſe of the animal requires another enlargement of its covering.

When a teſtaceous animal is going to enlarge its ſhell, as for inſtance the common ſnail, the body projects from the opening. It is then ſeen to attach itſelf to a wall or ſome other ſolid ſubſtance, and the portion of its body which is unprotected by the ſhell, is ſoon covered with the fluids which are excreted from its ſurface. The pellicle which they produce when the fluid dries, is at firſt thin and elaſtic, but gradually aſſumes more conſiſtence, and becomes at laſt ſimilar to the old part of the ſhell. If in this ſtage of the proceſs a bit of the ſhell is broken and removed, without injuring the body of the ſnail, the ſkin of the animal is ſoon covered with a fluid, which gradually thickens, and becomes ſolid.

82
Time neceſſary to form ſhell.

Twenty-four hours after the operation, a fine cruſt may be obſerved, which conſtitutes the firſt and external layer, for repairing the breach which was made. At the end of ſome days this layer has become thicker, and in 10 or 12 days, the new piece of ſhell which is formed, has acquired the ſame thickneſs as that which was removed. In making this experiment, certain precautions are neceſſary, otherwiſe there is ſome riſk of its failure. If, after the broken piece of the ſhell has been removed, and particularly if the fracture is made near the edge of the opening, the animal is not ſupplied with a ſufficient quantity of nouriſhment, its volume or bulk is ſoon diminiſhed; and now finding that what remains of the ſhell is a complete covering to its diminiſhed body, no excretion takes place for the production of a new portion. In removing ſnails from a wall to which they had attached themſelves, for the purpoſe of obſerving the progreſs of the formation of the ſhell, ſome days will eſcape after they are placed in the box, before the proceſs commences, becauſe the teſtaceous matter which had been already expended after fixing on the wall, muſt be fully ſupplied before any new portion can be again formed.

This experiment ſhows clearly, that ſhells are only enlarged by receiving new additions of matter, after it has been excreted from the body of the animal, and

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not by *intus-ſuſception*, or a circulation through the body of the ſhell itſelf. If this were the caſe, the production of new matter to fill up the breach made in the ſhell, would firſt appear all round the edge of the opening, and forming a kind of callus, ſimilar to what happens in the reproduction of bony matter in other animals, it would gradually extend till the whole breach is filled up. But, on the contrary, this matter firſt appears on the body of the animal from which it has exuded, and the whole extent of the opening is cloſed at once by the fluid which has been directly ſecreted from the ſurface of the body. Nor can it be ſuppoſed, that the liquid has inſenſibly exuded from the ſhell, and falling on the body of the animal, is there collected in ſufficient quantity for the formation of the new piece of ſhell. This is fully demonſtrated by the two following experiments of the ſame naturaliſt.

83
Other experiments of Reaumur.

Reaumur broke ſeveral ſhells of ſnails; and, having made a very large hole about the middle of the ſhell, and about an equal diſtance between its ſummit and opening, he introduced between the body of the animal and its ſhell, through the hole, a piece of ſkin which was extremely fine, but of a very cloſe texture. He glued this ſkin to the internal ſurface of the ſhell, ſo that it ſhut up accurately the artificial opening which he had made. It muſt then be obvious, that if the reproduction of the piece of ſhell which was removed, depended on the excretion of a fluid from the ſhell itſelf, and not on that which proceeds from the ſurface of the animal's body, the new piece of ſhell would be formed on the external ſurface of the piece of ſkin which was introduced; and it is not poſſible that it could be formed between the ſkin and the body of the animal. But the contrary of this has always happened. The new teſtaceous matter is always depoſited on the internal ſurface of the ſkin; that is, on the ſide which is in contact with the animal's body; and no matter whatever was depoſited on the other ſurface. This experiment has been repeated by others, and has been invariably attended with the ſame reſult.

The ſecond experiment made by Reaumur is not leſs deciſive than the firſt. He took a number of ſnails, and broke the ſhells, ſo that he diminiſhed the number of the turns of the ſpire about $\frac{1}{7}$ part. Having in this way rendered the ſhells too ſmall to cover the body entirely, they were nearly in the ſame ſituation as when an increaſe of the animal's body requires an augmentation of the ſhell. He then took a bit of ſkin, as in the former experiment, ſufficiently large for the opening of the ſhell, and introduced one of its edges between the body of the animal and the ſhell, to the interior ſurface of which he glued it; after which having folded back the other extremity of the ſkin on the external ſurface of the ſhell, he glued it in like manner, ſo that the whole external opening was completely covered with the ſkin. The reſults were exactly the ſame as before. The ſhell grew, the ſkin remained in its place, and that part of it which was attached to the interior ſurface was fixed between the new piece and the old ſhell, which conſequently could not contribute to its formation.

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From theſe experiments, which may be eaſily repeated, it appears that the increaſe of ſhells is owing to the ſecretion of an earthy and viſcid animal matter, which is prepared in the body of the animal, and which is ſucceſſively formed by layers from the interior part of the ſhell to the external ſurface. This formation is determined by the previous enlargement of the animal.

84
Layers of ſhells ſeen by burning.

The different ſtrata or layers of which ſhells are compoſed, can be eaſily demonſtrated by expoſing them to the action of fire, and removing them before their ſtructure is entirely deſtroyed. By this proceſs the animal matter is conſumed, and the earthy ſubſtance remains, exhibiting a laminated ſtructure. The ſame ſtructure may be demonſtrated, as has been already obſerved, in detailing Mr Hatchett's experiments, by immerſing a ſhell of the deſcription of mother-of-pearl in a diluted acid. The earthy matter in this caſe is diſſolved by the acid, and the layers of animal matter which are interpoſed, reſiſting the action of the acid, remain unchanged, and ſtill retain the original figure of the ſhell.

85
Turns of the ſpire increaſed.

It is a neceſſary conſequence of the mode in which the ſhells of ſnails are increaſed, that they cannot enlarge in volume, but by the augmentation of the turns of the ſpire, and that the length of each turn of the ſhell already formed remains always the ſame. This may be eaſily put to the teſt of experiment, by reducing the ſhell of a ſnail which has reached its full ſize to the ſame number of turns with thoſe of younger ſhells of the ſame ſpecies. The two ſhells do not then exhibit any other difference than in their thickneſs; and it would be the ſame, by comparing the youngeſt ſhells, thoſe which have been juſt ſeparated from the egg, with the firſt turns of thoſe of the ſame ſpecies which have been reduced by breaking them to an equal diameter. The number of turns or whirls of which the ſpire of a ſhell is compoſed, increaſes very conſiderably the ſize of the ſhell in univalves, and one turn more or leſs makes a great difference in their volume. According to Reaumur, the diameter of each turn of the ſpire is in the ſnail nearly double that of the preceding one, and $\frac{1}{2}$ of that which follows; but in many other ſhells, both marine and river, the laſt whirls of the ſpire, compared with the preceding ones, greatly exceed this proportion. In ſome, the external opening is 12 times greater than the preceding one, and in others, it is not more than eight times. This depends entirely on the increaſe of the animal's body, and the proportion of that increaſe. The growth of ſome is lengthwiſe, and in them the increaſe of diameter is proportionally leſs; while others increaſe more in thickneſs than in length. Thoſe teſtaceous animals which have only a few turns in the ſpire of the ſhell, are of this deſcription. To the former belong ſuch as have a greater number of turns in the ſpire.

86
The animal is detached from the ſhell in many caſes.

Thoſe who have adopted the opinion of Klein with regard to the formation of ſhells, have denied the ſeparation of the animal from the ſhell, which ſucceſſively takes place near the tip in univalves. It is indeed on this circumſtance of the connexion of the animal with the ſhell, that the truth of this theory depends. According to it, the animal is attached to the internal ſurface of the tip of the ſhell in univalves, and on this connexion depend the increaſe of the ſhell and even the life of the animal. But it is a certain fact, that the poſterior part of the body of the animal is entirely detached from the tip of the ſhell: and this holds, not only with regard to all land and ſea ſhells which have loſt the firſt turns of the ſpire, and conſequently thoſe of the tip; but alſo in a great number of other marine teſtaceous animals. It ſeems not only certain, but even neceſſary, that this ſeparation between the animal and the ſhell ſhould alſo take place in bivalve ſhells, if we take a diſtinct and rational view of their growth. Whether this ſeparation is ſuddenly effected, or by a gradual proceſs, which is moſt probable, it ſeems to be ſufficiently obvious, by examining the internal ſurface of the valves. This is ſtill more ſtrongly confirmed by ſawing univalve ſhells, particularly thoſe which are conſiderably elongated, and have a great number of turns in the ſpire, in a direction perpendicular to their axis. In old ſhells, ſeveral of the firſt turns of the ſpire will be found completely filled up with teſtaceous matter, ſo that the tip of the ſhell has become quite ſolid, or at leaſt it will appear to have been long unoccupied by any part of the body of the animal. But in tranſparent ſhells, as in ſome ſpecies of helix, it is ſeen that this attachment does not exiſt; and the H. planorbis can be preſerved alive, although the tip of the ſpire is broken off.

SECT. III. *Of the Colours of Shells.*

87 Inquiry curious.

THE infinite variety of the colours of ſhells is one of the moſt ſtriking parts of their hiſtory; and it becomes a curious and intereſting object of inveſtigation to inquire, whether theſe colours are uniform and conſtant in the ſpecies, and from what proceed this regularity and uniformity. The experiments and obſervations of Reaumur will aſſiſt us in this inveſtigation. When a hole is made in a ſhell, nearly at an equal diſtance between its tip and opening, the new piece of ſhell which is formed to ſhut up the hole is uſually of a white colour, and often very different from that of the reſt of the ſhell. It would appear at firſt that the new piece is of a different nature, and that it is not formed in the ſame way as the reſt of the ſhell. To meet this difficulty, it will be neceſſary to explain on what depends the regular variety of the colours of certain ſhells: the ſame experiments which lead to the diſcovery of the cauſe of the one, will ſerve to unfold the other.

88 Colours vary from particular circumſtances.

This remarkable variety of colour is in no ſhell more remarkable than in the *helix nemoralis*. The ground of this ſhell is white, citron or yellow, or a compound of different ſhades of theſe colours. Different coloured rays are traced on this ground, turning ſpirally with the ſhell; in ſome they are black, in others brown, and ſometimes reddiſh. The breadth of each of theſe rays gradually increaſes as they approach to the opening of the ſhell. It even ſometimes happens, that two of theſe bands are ſo much extended in breadth, that they meet together and form one. Some individuals have five or ſix of theſe bands, while others have three or four, and even two, and ſometimes only one. Others again have none at all, although of the ſame ſpecies; and among the individuals which are marked with coloured bands, they are not always of the ſame breadth in the ſame parts of the ſhell; from which it appears, that no certain ſpecific characters can be derived from the colour, ſince it is ſubject to ſo much variety. According to Reaumur, the viſcid and earthy matter of which the ſhell is compoſed is ſecreted from the ſurface of the animal's body; but in certain places of the ſurface, particles which produce a different colour are ſeparated; and whether this depends on a peculiar organization of thoſe places, or on the form of the particles themſelves, it appears that theſe particles, either of a different nature or of a different figure, by uniting, form bodies which reflect different rays of light; that is to ſay, form parts of the ſhell of different colours.

89 Colouring matter ſecreted from the neck.

This ſeems to be a neceſſary conſequence of the mode in which the growth of ſhells is accompliſhed. The whole external layer of the ſhell is formed by the neck of the animal, becauſe it is that part which is neareſt to the head, and conſequently as the animal increaſes in ſize, this part ceaſes to be covered with the old ſhell. It, therefore, depends on this part of the animal to extend the ſhell, and for this purpoſe it is ſufficient that the neck be furniſhed with glands for ſecreting the different fluids, to form a ſhell of different colours. If, for inſtance, there are two or three glandular bodies which ſecrete brown or black particles, and that theſe glandular bodies are diſpoſed in a parallel direction to each other, while the glands on the reſt of the ſurface only ſecrete particles of matter which reflect the light of a citron colour, the ſhell formed by theſe bodies will have a citron ground, with black or brown bands, nearly parallel, or which gradually approach to each other, and become larger in the ſame proportion as the external organs of the animal increaſe in ſize.

90 Proved by experiment.

If no ſuch glandular ſtructure, or difference in the matter ſecreted, could be traced on the neck of the *helix nemoralis*, this explanation of the cauſe of the variety of colours in ſhells would appear extremely probable; but this probability amounts to certainty, from the actual obſervation of the exiſtence of this peculiarity of ſtructure and effect. When the *helix nemoralis* is deprived of part of its ſhell, the body appears of a white colour, excepting towards the neck, where the white inclines to yellow, and where beſides there is a number of black or brown bands, equal to that of the bands on the ſhell, and arranged in the ſame direction. It has been obſerved, too, that the individuals which have only one black ſtripe on the ſhell, have only one ſingle black ſpot on the neck; and thoſe having four ſpots on the neck, have four ſtripes of the ſame colour on the ſhell. Theſe rays are placed immediately under thoſe of the ſhell; they commence at the diſtance of about a line from the extremity of the neck, which is itſelf uſually ſpotted with black all round. The exiſtence, therefore, of theſe excretory organs can no longer be doubted. The difference of colour ſeems to prove the difference of ſtructure. But to eſtabliſh this beyond the poſſibility of doubt, it is only neceſſary to have recourſe to experiment, by obſerving what happens in the new piece of ſhell which is renewed, in place of that portion which has been removed; and if it appear that that part of the ſhell which is formed oppoſite to the black rays of the animal, is black, and if that which is formed between the ſtripes be of a different colour from that of the ſtripes themſelves on the reſt of the body, no farther proof can be required. Now, it has been obſerved, that that part of the new ſhell formed on the neck oppoſite to the black or brown ſtripes on the animal's body, is itſelf black or brown, that formed between the ſtripes is white or citron, while the reſt of the body is white, but different from that of the neck, when it is of this colour.

91
Seeming exception.

It ſometimes happens, that the part of the ſhell which has been renewed is of a different colour. This apparent deviation will appear leſs difficult to be reconciled to the explanation of the proceſs which has now been given, if we attend to the circumſtance that the new ſhell formed oppoſite to the neck of the animal is never different from that of the old ſhell, excepting that the external ſurface is extremely rough, and preſents numerous furrows or grooves, in place of the ſmoothneſs and fine poliſh of the old ſhell. In this caſe, the inequality of ſurface is occaſioned by the motion of the animal retiring within its ſhell, before the new piece has acquired ſufficient conſiſtency and ſolidity; and thus the new ſhell, having contracted on its ſurface wrinkles or furrows, the light is very differently reflected. But there is another cauſe for this difference of colour in theſe circumſtances. When a large piece of ſhell is removed, the firſt layer which is formed is uſually white. The particles of the fluid which are neceſſary for the formation of the ſhell of this colour, ſeem to be more eaſily excreted from the ſurface of the body than the particles of fluid which go to the formation of any other colour. It is obſerved that the body of the animal is covered with this fluid, long before there is any appearance of ſecretion about the neck. This liquid is extended to the neck, and there produces a new layer of white ſhell; but as this layer is extremely thin and tranſparent, it does not prevent the uſual ſecretion of the colouring matter at the neck to appear. In this period of the proceſs, if the animal retire within its ſhell, the new layer, ſtill adhering in many points to its body, and not having acquiring ſufficient ſolidity, will be diſtorted and wrinkled; and not only exhibit that inequality of ſurface which generally appears in ſhells thus formed, but the arrangement of the ſtripes or colours will alſo be deſtroyed.

92
Cauſes of this.

It would be a very falſe concluſion from this account of the mode of the formation of the ſtripes which appear on certain ſpecies of ſhells, that the external ſurface of all ſhells ſhould be marked with colours, or ſhould be uniformly of the ſame colour; and that there ſhould be no ſhells whoſe external ſurface is marked with different ſpots, differently arranged, of an irregular figure, and ſeparated from each other by unequal intervals. For if it has been ſhown, that theſe colours are produced on the ſurface of the ſhell, only by means of the ſecretory organs, ſituated on the neck of the animal, it cannot be ſuppoſed that the ſame effects will follow, unleſs the animal is placed in the ſame circumſtances. Theſe ſecretory organs, therefore, muſt exiſt during the entire formation of the ſhell, to furniſh the ſame quantity of colouring matter during the whole of its progreſs. But if it happen on the contrary, that theſe organs undergo any change; if the pores through which the liquid is poured out to form a ſhell or part of a ſhell of a brown colour, become too large or too ſmall, or in other reſpects change their form, after having poured out a certain quantity of this fluid; and that thoſe which furniſh the fluid of which the white part of the ſhell is compoſed, are alſo changed, it muſt happen that the ſhell which is produced is marked with different black and white ſpots, combined with a degree of irregularity correſponding to the change on the ſecretory organs. This will appear to be the caſe, by attending to the changes which take place in the ſecretory organs of ſnails which produce coloured ſhells; for in them it may be obſerved, that the colours are diſtinct and well marked in ſome, towards the opening, while they are ſcarcely perceptible on the firſt turn of the ſpire towards the tip of the ſhell; and theſe changes of colour cannot be ſuppoſed to exiſt without a correſponding change on the ſecretory organs.

93
Changes in the organs.

94
Difference of fluidity in the matter ſecreted.

The fluidity of the liquid ſecreted for the formation of the ſhell, has probably alſo ſome effect in the regular diſtribution of the colours which appear on ſome ſpecies. It is eaſy to imagine that ſome animals may ſecrete a fluid for the formation of the ſhell, of ſuch a degree of fluidity as to flow eaſily from one place to another, and thus produce irregular marks on the ſhell. But beſides, if there are ſecretory organs ſituated on the neck of the animal, which prepare fluids of different colours; if the animal moves, or is diſturbed by any means, when theſe fluids are excreted on the ſurface, the colours will appear in a different place from their original diſtribution, or be mixed and blended together, and thus occaſion that irregularity which is obſerved in thoſe parts of ſhells which have been laſt produced, or renewed.

95
Motion of the animal during the depoſition of the matter.

96
Secretory organs enlarge with the animal.

But it will be neceſſary to have recourſe to the firſt of theſe cauſes, namely to the change of ſtructure in the ſecretory organs of the neck, to explain the regular diſtribution of the round ſpots, or of thoſe of a ſquare or rectangular figure, with which certain ſhells are marked, and to ſuppoſe that thoſe veſſels which are arranged in a ſquare or rectangular manner, which furniſh peculiar fluids, are ſhut or open at different periods. It may happen that the developement of a great part of the animal, occaſioned by a more vigorous growth in certain ſpecies than in others, may, in ſome caſes, be the only cauſe of thoſe regular ſpots, ſometimes white on a coloured ground, and ſometimes coloured on a white ground, which the ſhell exhibits, if the glands which ſecrete the colouring matter correſpond in their diſtribution to that of the diviſions on the ſhell, and if they occupy a greater ſpace on the neck than is uſual in other ſpecies. In this way may be accounted for, the regularity of theſe marks, and the increaſe of their ſize, which is uſually proportioned to that of the turns of the ſpire, from the conſideration of the ſecretory organs of the animal enlarging in the ſame proportion as the other parts of its body, and their effects in the formation of the ſhell correſponding to the developement of theſe parts. Hence it follows, that the largeſt marks are obſerved on the external convolutions of the ſhell.

97
Laſt formed layer uſually white.

According to Reaumur, the laſt layer of the ſhell which is formed from a fluid ſecreted from that part of the ſurface of the animal's body which does not reach the neck, ſhould be white, and this is moſt generally the caſe. In thoſe ſhells which are internally coloured, the fluids ſecreted from the body of the animal are of the ſame colour, and they take the place of thoſe which are uſually white, or of a pearly nature, as is obſerved in many others. The nature of theſe internal layers is always obvious; for if they are not white, they exhibit everywhere a uniform colour, and never variegated, like what appears externally. By removing with a file any part of the external ſurface of the ſhell, the layers which appear immediately under the ſurface, are thoſe which have been furniſhed by the body of the animal; while thoſe on the ſurface itſelf, uſually more variegated than the reſt, owe their formation to the veſſels about the neck, and have been formed in the way already deſcribed.

98
Formation of ſtriæ.

The growth of ſhells, being proportioned to that of the inhabitant, proceeds almoſt imperceptibly. In moſt ſhells, however, it is eaſy to diſtinguiſh the different additions which they have received; for they are marked on their convex ſurface with different eminences which are parallel to each other, ſimilar to lines of different degrees of depth, which give the ſhell a fibrous ſtructure. Theſe elevations are called *ſtriæ*, may be traced through the whole of the ſhell in bivalves, and in the longitudinal direction of thoſe which have a ſpiral form. From the ſlighteſt obſervation of the manner in which ſhells are formed, it is eaſy to ſee that they receive no addition, without leaving, in a greater or leſs degree, ſome traces of theſe inequalities; for every ſmall addition of teſtaceous matter which is made, muſt be attached to the old part of the ſhell, which conſequently muſt be more elevated than the former, whatever be its thickneſs, when the enlargement of the animal requires the formation of the latter. Thus, the ſhell will be marked with a great number of theſe ſtriæ, parallel to each other, which may be diſtinctly ſeen on many different ſpecies.

99
Growth interrupted.

Every ſhell has uſually ſome of theſe eminences at greater diſtances, and more elevated than the others. By theſe the different periods when the ſhell ceaſed to increaſe, or rather thoſe when its growth was interrupted, are marked; and they have ſome degree of analogy with the different ſhoots from the branch of a tree. The heat of ſummer or the cold of winter interrupting the growth of the animal, at leaſt among ſuch as are teſtaceous, which live on the land, or inhabit rivers in temperate regions, the ſhell is not enlarged in extent during theſe ſeaſons. It is otherwiſe, however, with regard to its thickneſs, for there is continually exuded from the body of the animal, ſmall quantities of fluid, which increaſe its thickneſs. Hence it is, when the ſhell begins to increaſe in extent, the edge to which the new portion is cemented, is much thicker than when the growth was gradual and imperceptible, and conſequently the place at which the growth commences after a long interruption is diſtinguiſhed by a more elevated ridge, than in the continued progreſſive additions which it receives. The numerous inſtances of this interruption in the growth of ſhells, will occur to the attentive conchologiſt in the progreſs of his reſearches.

100
Example of this.

We have at preſent in our poſſeſſion, a fine illuſtration of the ſame thing, in a ſpecimen of *murex ramoſus*. The animal, it would appear from the original part of the ſhell, had been for ſome time in a ſickly or unhealthy ſtate; for it has undergone many of the changes to which dead ſhells are ſubject. It has loſt its enamel; it ſeems to have undergone ſome degree of decompoſition, and ſome ſpecies of *ſerpula* and other paraſitical animals had made it their abode; but from this ſickly ſtate it ſeems to have recovered, and acquired great vigour; for the next addition which is made to the ſhell, is equal to its original bulk. It is clean, entire, and in perfect preſervation, forming a ſingular contraſt with the old ſhell.

101
Diſtinguiſhed by the difference of colour.

The place at which ſhells begin to increaſe, after the growth has been for ſome time interrupted, may be diſtinguiſhed by a difference of colour in the ſtripes with which the ſhell is uſually marked. In theſe places, black or brown ſtripes exhibit more vivid colours, and ſometimes even little different from thoſe on the reſt of the ſuperior ſurface of the ſhell. The cauſe of this change is not difficult to trace, if we recollect that the ſecretory organs which prepare the colouring matter, at leaſt in the *helix nemoralis*, have their origin at ſome diſtance from the extremity of the neck, from which we have ſeen that the firſt layer of ſhell which is traced to the extremity itſelf, ſhould be of a different colour from that of the ſtripes; but as the increaſe of the animal occaſions the ſtripes to be formed under the firſt ſhell, during which it is ſtill very thin, and conſequently tranſparent, it does not prevent the ſhell produced under it, of a black colour, to appear ſo. But when the animal has ceaſed to grow for ſome time, it then increaſes the thickneſs of the ſhell laſt formed, ſo that the ſhell which is next produced from the colouring matter, when the animal begins to grow, being laid on one part of the old ſhell much thicker and leſs tranſparent, the colour of theſe ſtripes muſt appear leſs bright, and therefore different in thoſe places, from the other parts of the ſhell.

102
Colours owing to the glands about the neck.

In taking a review of what has been ſaid concerning the production of the colours of ſhells, it muſt appear that theſe rays or coloured lines are owing to glands which ſecrete the colouring fluid, and which are arranged on the anterior edge of the neck, while the poſterior part furniſhes only a fluid of a different colour, and uſually leſs deep than the firſt. By means of this principle it is not difficult to account for the arrangement of the different colours which are ſo ſplendidly exhibited among this claſs of natural objects. Theſe colours may be reduced to one or more, which are more vivid on a lighter ground; to coloured, circular bands on a ground of a leſs vivid colour, or pure white; to longitudinal lines, round or ſquare ſpots, and in a regular, or irregular, zig-zag form. All theſe may be eaſily explained, according to the principles which have been laid down, the application of which, from what has been ſaid, will not, we hope, be found difficult.

103
Colours of porcelain ſhells.

But from this mode, which is the moſt general in the production of the colours of ſhells, there are certain deviations. In that diviſion of ſhells which is made by ſome naturaliſts, and which is diſtinguiſhed by the names of *porcelain ſhells*, on account of the fine enamel with which they are covered, there are two ſets of colours, which are diſpoſed in a parallel direction to each other. The external range of theſe colours is owing to a peculiarity of ſtructure in the animals which inhabit them, different from that of other teſtaceous animals, and to an operation which does not take place in other ſhells. In theſe ſhells, the colouring matter ſeems to be depoſited in two different ways, and at two different periods. In the firſt proceſs, when the body of the ſhell is formed, the colouring matter is excreted from the glands, in the ſame way as in other teſtaceous animals; and it is arranged according to the diſpoſition of the glands on the body of the animals. At this period of the proceſs, the ſhell is only of a moderate thickneſs, and much leſs than what it afterwards acquires, when completely formed. On the external ſurface of the ſhell firſt formed, another layer is depoſited, which is more compact than the firſt, in ſome places thicker, and uſually variegated with different colours. The external ſurface of the ſhell being thus completely covered with this ſecond layer, the original colours are concealed; and if the ſame ſhell were examined at different periods of its formation, it would appear like two diſtinct ſpecies.

104 An external layer formed.

The organs which are employed by the animal in the production of this ſecond layer of ſhell, and ſet of colours, are two ſoft, membranaceous wings, which being protruded from the opening of the ſhell, completely cover the whole of its external, convex ſurface. Theſe two wings, which are quite diſtinct from the glandular ſtructure above the neck of the animal, which is ſituated a little lower, are alſo provided with glands, which furniſh colouring matter, uſually different from that which is furniſhed by the glands of the neck; and it is the upper ſurface of the wings, which is alone provided with this glandular ſtructure. This ſurface, when this part of the animal is protruded from the ſhell, and extended over it, comes in contact with the external ſurface of the latter. Hence it is, that theſe membranaceous organs depoſit on the firſt formed and coloured layers of the ſhell, new layers of teſtaceous matter, which is differently coloured, and diverſified with entire ſpots, either circular, or in a waved direction, which are ſometimes of a more vivid tint than that of the ground, or white upon a dark ground, or brown upon a yellow ground; or are compoſed of ſtraight lines, or curved, or interlaced with each other, reddiſh, brown, yellow or white, on different coloured grounds, or in dots or points whoſe ſhades and arrangement are not leſs diverſified.

105 Proved.

This mode of the formation of the external layer of porcelain ſhells, has been proved by the actual obſervation of ſome naturaliſts. In ſome ſpecies, a longitudinal line of a paler colour is obſerved on the convex ſurface of the ſhell. This is aſcribed to the junction of the two wings of the animal, where a ſmaller quantity of colouring matter has been depoſited, or where the ſhell has been leſs completely covered with the protruded part of the animal. But the exiſtence of this ſecond layer is ſtill more diſtinctly proved by mechanical means. The external layer may be removed by means of a file, and the ſhell reſtored to its original ſtate; and then the colours which it firſt received are brought into view. This circumſtance is ſtill farther demonſtrated by an attentive examination of different ſpecies of ſhells, and particularly the *cypræa argus*. In examining this ſhell, there are obſerved under the external layer, which is of a yellow colour, ſome ſlight traces of four tranſverſe bands of a brown colour, which ſurround the ſhell, and which muſt have been formed previous to the more ſuperficial yellow layer. By a more minute examination, it will appear that the circular ſpots with which the external yellow layer is marked, have been poſteriorly formed to this layer; and finally, on the four turns of the ſpire forming a ſlight projection at the baſe of the ſhell, there are ſome brown, circular ſpots, which are quite ſuperficial, and which ſometimes include two turns of the ſpire, which could not happen if the yellow colour had not been prior in its formation to theſe circular ſpots. If the colouring matter of which theſe ſpots are compoſed, had been depoſited at the time that the different parts of the ſpire were formed, one ſpot could not have included two turns of the ſpire at the ſame time.

106 Shell becomes thicker from the ſame cauſe.

This effect of communicating a new ſet of colours to the external ſurface of the ſhell, is not the only one which is produced by the membranaceous ſtructure of the animal which inhabits the porcelain and other ſhells. The form of the ſhell is alſo changed in a remarkable manner, a great quantity of teſtaceous matter being depoſited on the ſurface of the opening, which then aſſumes a conſiderable thickneſs. The turns of the ſpire are incruſted, and ſometimes diſappear on the outſide of the ſhells; and wrinkles, furrows, and even tubercles, which exiſt on the ſurface of ſome ſpecies, are alſo formed. The ſurface of *cypræa pediculus* exhibits circular ſtriæ which did not originally exiſt, and which owe their formation to this cauſe. In other ſpecies, the ſurface is marked with projecting points or tubercles, which are produced in the ſame manner as the circular ſtriæ of the former, and which alſo depend on the ſtructure of the membranaceous wings of the animal, and the teſtaceous ſubſtance which is ſecreted and depoſited from their ſurface. Thus, it appears that porcelain ſhells, and thoſe of ſome other ſpecies, are formed at two diſtinct periods. It is during the ſecond period of the proceſs that the colour of the complete ſhell is formed. In farther illuſtration of this point, of the formation of ſhells of this deſcription at two different periods, one or two examples may be given of the difference which takes place, when the laſt layer formed is removed.

107 External layer removed different colours appear.

In the *cypræa exanthema*, the ſhell is ferruginous, with whitiſh round ſpots and eyes; but when the outer coat is worn off, it becomes barred or teſſelated with brown or blue. The *cypræa arabica*, as its name imports, exhibits characters on its ſurface, having ſome reſemblance to Arabic letters. The ground on which theſe characters, which are of a brown colour, are placed, is whitiſh or bluiſh; but when the outer coat is worn down, the ſhell is ſometimes bluiſh with brown bands, or pale with darker angular ſpots and lines, brown mixed with violet, or reddiſh blue.

108 Effects of light on ſhells.

But beſides the cauſes which have been mentioned concerning the production and variety of the colours of ſhells, ariſing from the difference of ſtructure in the organs which ſecrete the colouring matter, and the changes to which theſe organs are ſubjected in the growth of the animal, the effects of light and heat, altogether independent of the animal itſelf, are probably very conſiderable. Two individuals of the ſame ſpecies, the one from the Mediterranean or European ſeas, and the other from the tropical regions, exhibit very different ſhades of colour. The colours of the inhabitant of the torrid zone are always more bright and vivid than thoſe of the native of more temperate climates. The two ſhells, although ſimilar in form, ſize, and other characters, are uniformly different in the intenſity of their colours. Theſe differences, which have led conchologiſts to increaſe the number of ſpecies, obviouſly depend on the action of the climate, and particularly of light, on nouriſhment, and other circumſtances which

109 Lower valve colourleſs,

have hitherto eluded the obſervation of naturaliſts, are uniform and conſtant, as long as the cauſes which operate in their production, continue to act. At firſt ſight it might be ſuppoſed that the difference of temperature is the cauſe of the difference in the intenſity of colour, in ſhells produced in different climates. It might be ſuppoſed too, that the different depths at which ſhells are found in the ocean, the medium in which they live being thus very different, would occaſion great diverſity in the colour. Near the ſurface, where the heat is greateſt, if the operation of this cauſe were conſiderable, the colours of ſhells ſhould be expected to be moſt vivid, and as the depth increaſed, at leaſt to a certain extent, the intenſity of colour ſhould be diminiſhed. But it has been obſerved in bivalve ſhells which are found at great depths, ſuch as ſome ſpecies of oyſter and ſpondylus, that the lower valve which is attached to the rock, is almoſt always white or colourleſs, while the upper valve often exhibits bright and vivid colours; but this difference cannot be aſcribed to the difference of temperature, for in both valves it muſt be the ſame; the matter ſecreted for their formation is prepared by the ſame organs, and is depoſited in a ſimilar manner; and indeed they are altogether placed in the ſame circumſtances, and have been expoſed in their production and growth to the operation of the ſame cauſes, excepting that the upper valve is expoſed to the rays of light, and is therefore coloured, while the lower valve is removed from the action of this cauſe, and is colourleſs.

110 and ſhells included in other bodies.

The ſame difference is obſerved in the valves of other ſhells, which are produced in ſimilar circumſtances. The different ſpecies of pholas which make their abode in calcareous or coral rocks, and the *teredo navalis* or ſhip-worm, which pierces wood, and makes it its habitation, are uſually colourleſs. Thoſe teſtaceous animals too, which live at great depths in the ocean, and are thus far removed from the influence of light, are alſo diſtinguiſhed by very faint colours, or are entirely white.

SECT. IV. *Of the Formation of the Umbilicus, Protuberances, &c.*

We have hitherto conſidered only the general formation of ſhells. In the preſent ſection we ſhall treat of ſome other circumſtances which produce variations in their external figure. Such, for inſtance, is the formation of the umbilicus, of ſpines, tubercles, ribs, and other protuberances.

111 Four claſſes of ſpiral ſhells.

Umbilicus. Univalve ſhells, which are furniſhed with a regular ſpire, may be divided with regard to their form, into four claſſes; namely, ſhells having a diſc, cylindrical ſhells, turbinated, and ovoid or egg-ſhaped ſhells. Theſe four forms are the moſt common which ſpiral univalve ſhells aſſume, and they depend on the manner in which the turns of the ſpire are applied to the common axis, and the difference of their arrangement. They derive their primitive figure from the ſmall ſhell while it is yet included in the egg, and probably from that of the external organs of the animal which is contained in it. But although all univalve ſhells may be referred to one or other of theſe four principal forms, they exhibit a great variety of ſlighter ſhades of difference. Let us now ſee in what way it may be conceived that the bodies of the animals which inhabit univalve ſhells, give them a ſpiral form. If we can ſuppoſe that from the firſt production of theſe animals, when they begin to be developed, the fibres of one part of the body, ſuch as thoſe of the external ſurface, are longer than thoſe of the oppoſite ſurface, it is obvious that the body of the animal continuing to increaſe, according to this original tendency, will aſſume a curved form, the concave part of which will be on that ſide where the fibres are ſhorteſt; and if the long fibres on the external ſurface, and the ſhort fibres on the internal ſurface, continue to increaſe in the ſame proportion, this muſt give the body a ſpiral form; but in this caſe, the different convolutions of which the animal is compoſed, will be in the ſame plane, and can only apply to a ſmall number of ſhells included in the firſt diviſion, namely thoſe which are characterized with having a diſc.

112 Owe their ſhape to the form of the animal.

The convolutions of the ſpire which are deſcribed by the ſhell of univalve teſtaceous animals, and the body which ſerves as a mould for theſe, are diſpoſed in different planes. Some other cauſe, therefore, muſt operate in producing this deviation. Between the two ſurfaces of the body of the animal, which is ſuppoſed to be furniſhed with fibres of different lengths, it is eaſy to conceive two other ſurfaces directly oppoſite to each other, an upper and an under ſurface, each of which is included between the two preceding ſurfaces, but of ſmaller extent; and it is eaſy to conceive farther, that theſe two latter ſurfaces are ſo formed, that the fibres of the one are longer than the correſponding and oppoſite fibres of the other. According to this ſtructure, the body of the animal will tend to that ſurface on which the fibres are ſhorteſt, and thus deſcribe, during its developement, a ſpiral line in different planes, in proportion to the difference of tenſion between the ſuperior and inferior ſurface of the body, as well as between the lateral ſurfaces.

113 Umbilicus produced.

The form of the ſhell depending on the external form of the body of the animal, the umbilicus, which is a different cavity from that of the opening of the ſhell in which the animal is contained, and which is ſeen on the inferior ſurface of ſome ſhells, in the centre of the convolutions of the ſpire, depends entirely on the plane on which the animal has formed the additions to its ſhell. If the plane of theſe convolutions has been directed round a conical or elliptical axis, and each convolution of the ſpire be more or leſs diſtant towards the centre of the ſhell from this hollow point, a ſhell may be thus formed, whoſe umbilicus will be more or leſs open, according to the greater or leſs degree of ſeparation which the animal muſt give to the convolutions of the ſpire, correſponding to its ſtructure. An oppoſite effect will be obſerved, if the increaſe of the convolutions of the ſpire is ſuppoſed to take place round an axis which is ſo ſmall as to permit them to come in contact with each other. In this caſe no cavity will be formed in the centre, no appearance of umbilicus will be ſeen. But if we conceive that the animal, in enlarging itſelf, turns round a ſolid of a curved figure, in place of the conic axis above alluded to, and that the end of this ſolid is at the ſummit of the ſhell, it is obvious that an opening or an umbilicus of the ſhape of this ſolid, will be formed in the ſhell.

Ribs. The longitudinal elevations which are obſerved

114 Formation of ribs accounted for.

ſerved on univalve ſhells, which run in a tranſverſe direction to the ſucceſſive growth of the convolutions of the ſpire, have been denominated *varices*, by Linnæus, in alluſion to the dilated veins on the bodies of other animals. They are compoſed of one or more elevations, uſually arranged in a line parallel to the axis of the ſhell, and ſometimes ſlightly oblique. They conſiſt of the ſame ſubſtance as that of the reſt of the ſhell, but are thicker and always more elevated than the ſurface of the convolutions of the ſpire on which they are placed. To explain the manner in which theſe elevations are formed, we may examine the opening of land ſhells which have arrived at the laſt ſtage of their growth. This period is marked in theſe ſhells by a kind of margin of about a line in breadth, which is ſometimes turned outwards, although the reſt of the ſhell turns on a regular, ſpiral line. This reflected margin never appears in land ſhells, but when they have reached the laſt period of their growth, and when it is once fromed, the animal of ſome ſpecies ceaſes afterwards to continue the convolutions of its ſpire. Having now arrived at that period of its growth, when it is fit to perform the act of generation, it protrudes itſelf more frequently from its ſhell, and each time it returns, a viſcid fluid which exudes from its neck, is interrupted and depoſited on the external margin of the ſhell. The bulk which the anterior parts of the body have acquired in conſequence of the evolution of the generative organs which are contained in that part of the body, cauſes it to preſs more ſtrongly than formerly on the edges of the opening of the ſhell, every time it protrudes itſelf, and gradually forces the particles of teſtaceous matter which have been recently depoſited, to the external ſurface, and in a direction quite different from that of the former plane of the ſpire. A ſhort time only is requiſite for the complete formation of this elevation; but after it has been formed, if the animal has the power of continuing the ſpire on the former plane, the ſhell which had arrived at a larger ſize will exhibit from time to time, if the ſame proceſs be repeated, longitudinal projecting ribs, convex or bent, exactly ſimilar to the external ſwelling of the opening of the ſhell, and analogous to the *varices* which are ſeen on ſome ſpecies of marine ſhells.

115 Limited to ſea-ſhells.

This power of continuing the ſpire, after the formation of the eminence at the opening, is peculiar to ſea-ſhells. No farther increaſe, after it is once formed in land ſhells takes place. The young of ſome ſea-ſhells, as ſome ſpecies of *murex*, alſo poſſeſs this faculty of continuing the growth of the ſhell after the formation of ſimilar elevations, even from the earlieſt period of their exiſtence, and long before it can be ſuppoſed that the organs of generation are evolved. This no doubt depends on ſome peculiar ſtructure or organization of the animal, and particularly on thoſe of the anterior parts of the body.

116 Tubercles produced in the ſame way.

Tubercles. Many ſhells are furniſhed with tubercles, which are produced by the ſame organs as the reſt of the ſhell. The fleſhy protuberances which are placed on the external ſurface of the neck of the animals which inhabit them, ſerve as a mould, and according as there are more or leſs of theſe tubercles, while the animal enlarges the turn of the ſpire, and increaſes its ſhell ſo much, there is the ſame number of protuberances in the convolution. Theſe protuberances, while they remain on that part of the body of the animal on which they were formed, are hollow, and during the remaining part of its exiſtence, as the body enlarges, they are partly hollow, and partly ſolid, being filled up with teſtaceous matter, excreted from the body of the animal, and then the internal ſurface of the ſhell becomes ſmooth and even.

117 Spines produced by fleſhy proceſſes.

Spines, and fringed or irregular protuberances, with which ſome ſhells are armed, have, according to all appearance, the ſame origin as the other inequalities on the external ſurface of ſhells. They are uſually formed at the end of the different ſucceſſive periods of the growth of the ſhell. This will be ſufficiently obvious, if we trace the whole ſeries of wrinkles or ſtriæ which run parallel to the circumference of the opening. Thoſe which ariſe immediately from the ribs or *varices*, are produced by particular organs which ſurround the extremity of the neck, and ſtretch out from every part of its circumference, ſecreting a teſtaceous matter, which partly forms a ſheath around them, gradually increaſes in thickneſs, and ſucceſſively aſſumes the form of that part of the body which in ſome meaſure ſerves the purpoſes of a mould. In all the ſpecies of murex, which are furniſhed with ſpines, the elevations called varices or ribs, as well as the ſpines with which they are armed, are placed on the ſhell at equal diſtances; and the intermediate parts of the ſhell, although frequently grooved or ſtriated, are not furniſhed with ſpines. This uniform obſervation, not only in ſhells belonging to this genus, but alſo in almoſt all ſpinous ſhells, proves, that the ſpines, as well as the ribs, are to be conſidered as formed by the margin of the anterior parts of the body, which is renewed in the ſame proportion as the change in the poſition of this part of the body takes place. It proves alſo, that the formation of ſhells is entirely owing to the ſucceſſive and regular enlargement of the animal; and that it increaſes every time it is diſplaced from the whole extent in breadth of the anterior part of the body, the margin of which only being furniſhed with long fleſhy proceſſes or fringed appendices, is in reality the only part which produces them on the ſhell at each period of its increaſe. In the ſame way is formed the beak or prolongation of the ſhell, which terminates the inferior extremity in the form of a canal. This canal is produced in all ſhells in which it exiſts, by a cylindrical organ, ſuſceptible of extenſion and contraction, and which, according to ſome naturaliſts, is employed by the animal as a kind of feeler, and occaſionally to attach itſelf to ſolid bodies. It excretes and depoſits a teſtaceous layer which ſerves it as a kind of ſheath, in a ſimilar manner to the production of ſpines.

118 Formation of ribs and grooves.

It is eaſy to explain the formation of the grooves or elevated ribs which are found on the outer ſurface of other ſhells; while the whole of the internal ſurface is ſmooth and poliſhed. In bivalve ſhells, which exhibit this ſtructure, the whole anterior ſurface of the animal is grooved or channelled in the ſame way; and from this the ſhell derives its ſhape and ſtructure. In theſe ſhells it may be obſerved, that it is only the anterior margin that is grooved on the internal ſurface; becauſe, in the progreſs of the growth of the animal, that part of the body which preſents a ſmooth equal ſurface has advanced, and nearly filled the whole of the ſhell; and the teſtaceous matter ſecreted from this part of the body being depoſited on the grooves, channels, or ſtriæ, which were formed when the anterior part of the body occupied that part of the ſhell, fills them up completely, and leaves the ſurface quite ſmooth and poliſhed. New additions being made to the ſhell as the growth of the animal requires it, the ſmooth ſurface of the body advances forward, and fills up with its ſecretions what is now grooved; while the new part of the ſhell, which correſponds to that part of the body which has an unequal ſurface, only preſents this appearance. It is in this way that the ribs or grooves are formed in different ſpecies of oſtrea, cardium, and other bivalve ſhells.

119 Formation of hollow ribs.

But there is a peculiarity of ſtructure in a ſpecies of cockle, the white fluted or ribbed cockle, *cardium coſtatum*, which ſeems more difficult of explanation in its mode of formation. The ribs of this ſpecies are not only of the uſual ſtructure of other ſpecies of ribbed or grooved ſhells, but are particularly diſtinguiſhed by having them hollow. The whole number of the ribs amounts to about 18 on each valve, of which the 11 exterior ones are of a triangular form, of about three lines high, and hollowed through their whole length, from the beak to the margin of the valves. To have a diſtinct notion of the formation of theſe hollow, triangular ribs, it is neceſſary to conceive, that the margin of the anterior part of the animal is deeply channelled or grooved; and when this part of the body is in contact with the recent ſhell, the tips or elevations are formed, and are then open to the internal ſurface of the ſhell; but the poſterior part of the body being hard and ſmooth, never comes in contact with the excavated part of the ribs. On the contrary, as the teſtaceous matter is excreted from this part of the body, it is depoſited on that part of the internal ſurface of the ſhell which it touches, ſtretches acroſs the deep grooves, and forms the third and interior ſide of the triangular ribs.

120 and of ſtriæ, &c.

Thus it appears, that ſpines, tubercles, and all other protuberances on the ſurface of bivalve ſhells, owe the peculiarity of their form and ſhape to the peculiar ſtructure of different organs ſituated on the anterior margin of the body of the animal, and are compoſed of the teſtaceous matter which is excreted by theſe organs. The nature of the proceſs is the ſame as in univalve ſhells of a ſpiral form. The diverſity only appears in the difference of the organs and ſtructure of the animals which inhabit different ſhells. To a ſimilar proceſs may be aſcribed the formation of ſtriæ, of ſcales, and of various excavations which ſometimes accompany them.

SECT. V. *Of the Production of Pearls.*

121 Pearl found in mother-of-pearl ſhells

IN treating of the conſtituent parts of ſhells, it was obſerved, that the compoſition of the pearl appears, from analyſis, to be preciſely the ſame as the mother-of-pearl, or thoſe ſhells in which the pearl is uſually found. From this we muſt conclude, that the pearl, and the mother-of-pearl, are produced by the ſame ſecretion. It appears, from the obſervations of naturaliſts, and indeed it might have been expected, from the ſimilarity of compoſition, that all teſtaceous animals, whoſe ſhells come under the deſcription of mother-of-pearl, occaſionally produce pearls.

Different opinions have been entertained with regard to the cauſe of the formation of this precious production. According to ſome, it is merely a morbid concretion, formed within ſome part of the body of the animal, or at leaſt within the ſhell, without any apparent external injury; while others ſuppoſe that it is only owing to wounds which the ſhell, or the animal, or both, have received from accidental cauſes, or from the action of inſects, or ſome teſtaceous animal, making perforations in the ſhell. It is not improbable that pearls may be formed in both ways.

122 Suppoſed to be morbid concretions;

Every day's experience informs us, that ſimilar concretions are formed in different cavities of the bodies of other animals; but without any obvious cauſe or external injury. The formation of ſuch concretions, as, for inſtance, biliary and urinary calculi, producing the moſt excruciating diſorders in the human body, are too fatally known. Theſe concretions, no doubt, owe their origin to the diſeaſed or unhealthy action of the veſſels ſecreting the fluids in which they are formed. By this diſeaſed action producing a ſuperabundance of the matter which enters into the compoſition of the concretion; or this matter in the fluid ſtate meeting with ſome ſolid body, which becomes a nucleus, is attracted by it, and depoſited in concentric layers, till the concretion acquires a larger or ſmaller ſize, according to the duration and quantity of the ſecretion and depoſition. In the ſame way, it ſeems extremely probable the pearl may be frequently formed; the matter of which it is compoſed being conſtantly ſecreted by the animal for the production of the new part of the ſhell. If then this matter ſhould at any time be produced in greater quantity than what is neceſſary to form the inner layers of the ſhell, and particularly if it ſhould meet with a ſolid particle of any body, it will be attracted by it, and thus conſtitute the rudiments of a pearl, which will receive conſtant additions of concentric layers, and increaſe in ſize in proportion to the age of the animal and the quantity of matter depoſited. Pearls, it is ſaid, have been found within the body of the animal. If this be true, the pearly matter, in its paſſage through the veſſels of the body, muſt have met with ſome nucleus, around which the concentric layers have been formed. In moſt caſes, however, the pearl is found looſe in the ſhell, entirely detached from the animal. It muſt then have been formed of the matter which was thrown out of the body; but it is not unlikely that pearls are formed both ways, or that the ſame pearl may be partly formed within the body of the animal, and be afterwards excluded, and arrive at its utmoſt ſize, while it remains looſe in the ſhell.

123 or formed from external injury.

But, according to others, the pearl owes its formation to ſome external injury. The following ſeems to be a pretty diſtinct view of this opinion. When Faujas de St Fond viſited Loch Tay, he was led to make ſome inquiries concerning the pearl-fiſhery, which had been carried on in ſeveral parts of the river Tay for ſome years. Shells were brought to him; and in theſe ſhells the fiſhermen pretended to find pearls, which they expected to ſell at a higher rate, as they were found in the preſence of the traveller. But he informs us, that they attempted to impoſe on him, by introducing a pearl ſecretly into the ſhells as they opened them. Obſerving this circumſtance, he told them that he could know at once, by examining the outſide of the ſhell, before opening it, whether it contained any pearl. He mentions this to introduce ſome ſpeculations concerning its formation. When no perforation or calloſity appeared on the outſide, he concluded that there was no pearl in the ſhell. The pearl-fiſh, he ſuppoſes, is attacked by two claſſes of enemies. One is what he calls the *auger-worm*, which penetrates into the inſide near the edge of the valve, by making a longitudinal paſſage between the layers of the ſhell. The length of the channel is one inch, or one inch and a half when it doubles back in a line parallel to the firſt. At the inner extremity there is a ſmall circular portion, formed by the worm in turning round. Theſe excavations are in the pearly part of the ſhell. The pearly juice, extravaſating, forms protuberances in the ſame direction; and the cylindrical bodies which are thus formed, may be conſidered as elongated pearls adhering to the internal ſurface. When ſeveral worms of this kind unite their labours by penetrating near each other, the reſult is a kind of pearly wen with irregular protuberances.

Another ſea-worm, which he ſays belongs to the multivalves, a ſpecies of pholas, alſo attacks the pearl ſhells. The ſhell of this ſpecies of pholas has a hinge in the form of a crooked bill, as he ſaw in ſome ſpecies of oyſter, which he examined, from the coaſt of Guinea. The hole was of the ſhape of a pear. Pearls of this ſhape have been found, and have been held in great eſtimation. Obſerving this circumſtance, artificial perforations are made in the ſhell, and this forces the animal to produce pearls. In ſome ſhells brought from China, this artificial hole has been obſerved filled up with braſs wire, rivetted on the outſide like a nail, and the inner extremity of the wire was covered with a well-formed pearl, which ſeemed as if ſoldered to its extremity *.

Pearls are alſo produced by another artificial proceſs. The ſhell is opened with great care to avoid injuring the animal, and a ſmall portion of the internal ſurface of the ſhell is ſcraped off. In its place is inſerted a ſpherical piece of mother-of-pearl, about the ſize of a ſmall grain of lead ſhot. This ſerves as a nucleus, on which is depoſited the pearly fluid, and in time forms a pearl. Experiments of this kind have been made in Finland, and have been repeated in other countries.

124 Diſcovery of Linnæus.

A remarkable diſcovery has been aſcribed to Linnæus reſpecting the generation of pearls. This was a method which he found out, of putting the pearl muſſel (*mya margaritifera*) into a ſtate of producing pearls at his pleaſure. It was ſome years before the final effect could take place; but, in five or ſix years after the operation, the pearl, it is ſaid, had acquired the ſize of a vetch. But it does not ſeem to be known in what this operation conſiſted. Whether it conſiſted in imitating the proceſs of inſects, by wounding the ſhell from the outſide, or by following the other proceſs, by ſcraping away part of the inner layer; nor is it much known what have been the effects of this operation, or whether it has turned to any account, or indeed is at all practiſed in Sweden or any of the northern ſtates, where it muſt have been originally known. For this diſcovery, however, the Swediſh naturaliſt, it is ſaid, was raiſed to the rank of nobility, and otherwiſe liberally rewarded by the ſtates of the kingdom.

The value which is put on the pearl depends on its ſize, colour, ſhape, and purity. The largeſt pearls are always held in the higheſt eſtimation, when their other qualities are in any degree of perfection. The fineſt ſhape of the pearl muſt be quite globular; it muſt be of a clear brilliant white, ſmooth, and gloſſy, and entirely free from ſpot or ſtain. Pearls were greatly eſteemed and much ſought after by the Romans. Servilia, the mother of Marcus Brutus, we are informed, preſented a pearl to Cæſar, which was valued at 50,000l. ſterling; and Cleopatra diſſolved one, which is ſaid to have been worth 250,000l. ſterling, in vinegar, which ſhe drank at a ſupper with Mark Antony.

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* Trav. vol. ii.

CHAP. VI. OF THE HABITATION OF TESTACEOUS ANIMALS, METHODS OF FISHING, COLLECTING, &c.

TO the detailed account which we have now given of the natural hiſtory of teſtaceous animals, and particularly of the formation and growth of the ſhell, we have only to add a few obſervations concerning their habitation, the methods of fiſhing, collecting, and preſerving them. Theſe topics ſhall be the ſubject of the following ſections.

SECT. I. *Of the Habitation of Teſtaceous Animals.*

125 Found on every part of the globe.

TESTACEOUS animals are found on every part of the ſurface of the globe. Some are inhabitants of the land, while others only frequent rivers and lakes, and a third and numerous claſs live in the ocean. From this a claſſification of ſhells has been formed, and they have been divided into land, freſh-water, and ſea ſhells. But whatever difference might exiſt in the habits and economy of teſtaceous animals which are produced in places ſo different, it affords few marks of diſcrimination for the purpoſe of claſſification.

126 Land ſhells very numerous.

Land ſhells are ſpread over the whole ſurface of the earth, and although more acceſſible, are perhaps leſs known than thoſe which inhabit the ocean. From the ſmall number of land ſhells which have been collected, it would appear at firſt ſight that they are leſs numerous than marine ſhells. This, however, ſeems not to be the caſe with regard to the number of ſpecies; and it is well known, that the number of individuals of land ſhells, in ſome inſtances, far exceeds that of ſea ſhells. The ſea ſhells of the Mediterranean have been obſerved by naturaliſts, to be nearly the ſame from the ſtraits of Gibraltar to the iſland of Sicily; but the land ſhells of Languedoc are different from thoſe of Provence, of Dauphiny, Piedmont, and different parts of Italy. Some are found in Spain, in Corſica, in Sardinia and Sicily, which are not to be met with in other places;

and from the great variety and number of land ſhells, it ſeems probable that many of them are yet unknown. But let us now take a general view of thoſe places of the world where different teſtaceous animals are moſt frequently found.

127 Shells moſt beautiful within the tropics.

It has been already obſerved, that light and heat have very conſiderable influence in adding to the ſplendour of the colours of ſhells. The moſt beautiful ſhells are found in countries between the tropics, where they are more immediately ſubject to the direct rays of the ſun, and a higher temperature. From theſe cauſes, the ſhells produced in theſe countries have a luſtre and brilliancy, which thoſe of colder climates never poſſeſs.

128 Shells found in Aſia.

The ſhores of Aſia furniſh us with the pearl-oyſters and ſcallops in great perfection. About Amboyna are found the moſt beautiful ſpecimens of the cabbage-ſhell, the arroſoir, the ducal mantle, and the coral-oyſters, or echinated oyſters. Here alſo are found a great variety of extremely beautiful muſſels, tellinæ, and volutæ; ſome fine buccinums, and the ſhell called the *Ethiopian crown*, in its greateſt perfection. The dolia, the murices, and the caſſandræ, are alſo found on theſe coaſts in great beauty. Many elegant ſnails and ſcrew-ſhells are alſo brought from thence; and finally, the ſcorpion and ſpider ſhells. The Maldive and Philippine iſlands, Bengal, and the coaſt of Malabar, abound with the moſt elegant of all the ſpecies of ſnails, and furniſh many other kinds of ſhells in great abundance and perfection. China abounds in the fineſt ſpecies of porcelain ſhells, and has alſo a great variety of beautiful ſnails. Japan furniſhes us with all the thicker and larger bivalves; and the iſle of Cyprus is famous above all other parts of the world for the beauty and variety of the patella or limpet found there.

129 In America.

America affords many very elegant ſhells, but not in ſo great abundance or beauty as the ſhores of Aſia. Panama is famous for the cylinders or rhombi, and we have beſide, from the ſame place, ſome good porcelains and a very fine ſpecies of *dolium*, or *concha globoſa*, called from this place the *Panama purple ſhell*. One of the moſt beautiful of the cylinders is alſo known among our naturaliſts under the name of the *Panama ſhell*. About Braſil, and in the gulf of Mexico, there are found murices and dolia of extreme beauty; and alſo a great variety of porcelains, purpuræ, pectens, neritæ, bucardiæ or heart-ſhells, and elegant limpets. The iſle of Cayenne affords one of the moſt beautiful of the buccinum kind, and the Midas ear is found principally about this place. Jamaica and the iſland of Barbadoes have their ſhores covered with porcelains, chamæ, and buccina; and at St Domingo there are found almoſt all the ſame ſpecies of ſhells that we have from the Eaſt Indies; only they are leſs beautiful, and the colours more pale and dead. The pearl-oyſter is found alſo on this coaſt, but ſmaller than in the Perſian gulf. At Martinico there are found in general the ſame ſhells as at St Domingo, but yet leſs beautiful. About Canada are found the violet chamæ; and the lakes of that country abound with muſcles of very elegant pale blue and pale red colours. Some ſpecies of theſe are remarkably light and thin; others are very thick and heavy. The Great Bank of Newfoundland is very barren in ſhells; the principal kind found there are muſſels of ſeveral ſpecies, ſome of which are of conſiderable beauty. About Carthagena there are many mother-of-pearl ſhells, but they are not of ſo brilliant colours as thoſe of the Perſian gulf. The iſland of Magellan, at the ſouthern point of America, furniſhes us with a very remarkable ſpecies of muſſel called by its name; and ſeveral very elegant ſpecies of limpets are found there, particularly the pyramidal.

130 In Africa.

In Africa, on the coaſt of Guinea, there is a prodigious quantity of that ſmall ſpecies of porcelain which is uſed there as money; and there is another ſpecies of porcelain on the ſame coaſt which is all over white: the women make bracelets of the latter, and the people of the Levant adorn their hair with them. The coaſt of Zanguebar is very rich in ſhells; we find there a vaſt variety of the large porcelains, many of them of great beauty; and the *nux maris* or ſea-nut is very frequent there. Beſide theſe, and many other ſhells, there are found on this coaſt all the ſpecies of nautili, many of which are very beautiful. The Canary iſles abound with a vaſt variety of the murices, and ſome other good ſhells; and we have from Madeira great variety of the echini or ſea-eggs, different from thoſe of the European ſeas. Several ſpecies of muſſels are alſo common there, and the ſea-ears are nowhere more abundant. The Red ſea is beyond all other parts of the world abundant in ſhells, ſcarcely any kind is wanting there; but what we principally have from thence are the purpuræ, porcelains, and echini marini.

131 In the Mediterranean.

The Mediterranean and Northern ocean contain a great variety of ſhells, and many of very remarkable elegance and beauty; they are upon the whole, however, greatly inferior to thoſe of the Eaſt Indies. The Mediterranean abounds much more in ſhells than the ocean. The gulf of Tarentum affords great variety of purpuræ, of porcelains, nautili, and elegant oyſters; the coaſts of Naples and Sardinia afford alſo the ſame, and with them a vaſt number of the ſolens of all the known ſpecies. The iſland of Sicily is famous for a very elegant kind of oyſter which is entirely white; pinnæ marinæ and porcelains are alſo found in great plenty there, with tellinæ and chamæ of many ſpecies, and a great variety of other beautiful ſhells. Corſica is famous, beyond all other places, for vaſt quantities of the *pinnæ marinæ;* and many other very beautiful ſhells are found there. About Syracuſe are found the gondola ſhell, the winged murex, and a great variety of elegant ſnails, with ſome of the tuns and nerites. The Adriatic ſea, or gulf of Venice, is leſs furniſhed with ſhells than almoſt any of the ſeas thereabout. Muſſels and oyſters of ſeveral ſpecies are however found there, and ſome of the cordiform or heart ſhells; there are alſo ſome tellinæ. About Ancona there are vaſt numbers of the pholades buried in ſtone; and the ſea-ears are particularly frequent about Puzzoli. (*Bonani Recreat. Ment. et Ocul.*)

132 On the coaſt of France,

The ports of Marſeilles, Toulon, and Antibes, are full of pinnæ marinæ, muſcles, tellinæ, and chamæ. The coaſts of Bretagne afford great numbers of the conchæ anatiferæ and pouſſe-pieds; they are found on old rotten boards, on ſea ſubſtances, and among cluſters of ſponges. The other ports of France, as Rochelle, Dunkirk, Breſt, St Maloes, and others, furniſh oyſters excellent for the table, but of the common kind, and of no beauty in their ſhells; great numbers of muſſels are alſo found there; and the common tellinæ, the onion-peel oyſters, the ſolens, and conchæ anatiferæ, are alſo frequent there. At Granville, in Lower Normandy, there are found very beautiful pectens, and ſome of the cordiform or heart-ſhells.

133
Of Britain.

Our own Engliſh coaſts are not the leaſt fruitful in ſhells, though they do not produce ſuch elegantly painted ones as the Indies. About Plymouth are found oyſters, muſſels, and ſolens, in great abundance; and there, and on moſt of our ſhores, are numbers of the aures marinæ and dentalia, with pectens, which are excellent food; and many elegant ſpecies of the chamæ and tellinæ are fiſhed up in the ſea about Scarborough and other places. Ireland affords us great numbers of muſſels, and ſome very elegant ſcallop-ſhells in great abundance, and the pholades are frequent on moſt of our ſhores. We have alſo great variety of the buccina and cochleæ, ſome volutæ; and, on the Guernſey coaſt, a peculiarly beautiful ſnail, called thence the *Guernſey ſnail*.

134
Of Spain and Portugal, &c.

The coaſts of Spain and Portugal afford much the ſame ſpecies of ſhells with the Eaſt Indies, but they are of much fainter colours, and greatly inferior in beauty. There are, according to Tavernier and others, ſome rivers in Bavaria in which there are found pearls of a fine water. About Cadiz there are found very large pinnæ marinæ, and ſome fine buccina. The iſles of Majorca and Minorca afford great variety of extremely elegant ſhells. The pinnæ marinæ are alſo very numerous there, and their ſilk is wrought into gloves, ſtockings, and other things. The Baltic affords a great many beautiful ſpecies, but particularly an orange-coloured pecten, or ſcallop-ſhell, which is not found in any other part of the world.

135
Freſh water ſhells.

The freſh-water ſhells are found much more frequently, and in much greater plenty than the ſea-kinds; there is ſcarce a pond, a ditch, or river of freſh water in any part of the world, in which there are not found vaſt numbers of theſe ſhells with the fiſh living in them. All theſe ſhells are ſmall, and they are of very little beauty, being uſually of a plain grayiſh or browniſh colour. Our ditches afford us chamæ, buccina, neritæ, and ſome patellæ; but the Nile, and ſome other rivers, furniſhed the ancients with a ſpecies of tellina which was large and eatable, and ſo much ſuperior to the common ſea tellina in flavour, that it is commonly known by the name of *tellina regia*, "the royal tellina." We have a ſmall ſpecies of buccinum common in our freſh waters, which is very elegant, and always has its operculum in the manner of the larger buccina; a ſmall kind of muſſel is alſo very common, which is ſo extremely thin and tender, that it can hardly be handled without breaking to pieces. The large freſh-water muſſel, commonly called in England the *horſe-muſſel*, *mya margaritifera*, is too well known to need a deſcription; and the ſize ſufficiently diſtinguiſhes it from all other freſh-water ſhells.

SECT. II. *Of the Methods of Fiſhing and Collecting Shells.*

136
Land ſhells.

LAND ſhells are immediately within the reach of the hand of the collector, as well as many ſea and river ſhells, which inhabit ſhallow waters, or attach themſelves to rocks or marine plants on the ſhores of the ocean. Thoſe ſhells which are at moderate depths in the ſea, are to be collected by dredging. But in whatever way ſhells are found, thoſe are always to be preferred which ſtill contain the living animal; for then, not only ſome information may be obtained with regard to its ſtructure and natural hiſtory, but the ſhells themſelves are in all their natural beauty, and the full glow of their colours. 137 Sea ſhells. Thoſe ſhells too ſhould be preferred, which are procured from the deeper parts of the ocean, becauſe they have then arrived at the largeſt ſize, and are in the greateſt perfection. But theſe are beyond the reach of man, and are only accidentally found on the ſhores after ſtorms, or attached to ſea-weeds which have been torn from the rocks by the agitation of the waves.

138
Method of killing the animal.

When ſhells are found with the animal alive; the method recommended to deſtroy it and ſeparate it entirely from the ſhell, is to boil it in water for a very ſhort time, and after allowing it to cool gradually, to lay it in cold water till it is cleaned. By this proceſs, the attachment between the ſhell and animal is deſtroyed, and the latter, which has become hard and contracted, is eaſily picked out from its covering. The ſhell, after this treatment, is ready to be placed in the cabinet, or to be poliſhed in the way we ſhall preſently deſcribe, according to the ſtate in which it is found, or the views of the collector.

139
Pearl-fiſhery.

As the pearl has been held in high eſtimation in all ages of the world, and as it is an important object of commerce in many parts of it, the hiſtory of the pearl fiſhery, or of thoſe ſhell fiſh which produce the pearl, cannot fail to be intereſting.

140
In Britain.

In different parts of Britain the pearl-fiſhery has been carried on to a conſiderable extent; and in ſome places it has been reckoned of ſuch value, that government has granted the right of fiſhing to individuals by patent. By a grant of this kind, Sir John Hawkins obtained the privilege of fiſhing for pearls in the river Irt in Cumberland; and Buchan of Auchmacoy ſeems to have held, by a ſimilar right, the ſole privilege of the pearl-fiſhery near the mouth of the river Ythan in Aberdeenſhire; for it appears that this grant was reſumed by government in 1633, in the firſt parliament of Charles I. In the ſame river, at the diſtance of 10 miles from the ſea, a ſucceſsful fiſhery of pearls has been frequently carried on; and a few years ago, in the river Cluny in the ſame county, a Jew employed a number of people to collect the muſſels which contained them, and ſome large and valuable pearls were found. Some years ago, in the river Teath in Perthſhire, the pearls which were got brought about 100l. ſterling to thoſe employed in ſearching for them, in the courſe of one ſeaſon. It was obſerved, that thoſe muſſels only which were crooked and diſtorted, yielded pearls. The method which has been practiſed in this river for fiſhing the pearl muſſel, is the following. The fiſherman provides himſelf with an inſtrument formed of two iron plates or ſpoons, having ſomething of the ſhape of the muſſel. Each of theſe is attached to an elaſtic handle of the ſame metal, terminating in an open tube, which is fixed to the end of a long wooden handle. The concave ſides of the plates approach other, and are kept in cloſe contact by the elaſticity of the handles. With this inſtrument the fiſherman enters the water, and directs his courſe to thoſe places which he ſuppoſes are reſorted to by the muſſels. Theſe he diſcovers with his feet, and having found one, he preſſes the inſtrument upon it, the plates or valves of which, in conſequence of the elaſticity of the handles, ſeparate, and then graſp it firmly. In this way he can detach it from the place to which it adheres, and bring it to the ſurface of the water. The pearl-muſſel is a native of many other of the rivers of Scotland, as of the Eſk in Forfarſhire, where a pearl was found of the ſize of a piſtol bullet, and ſold for 4l. ſterling; of the Devon in Clackmannanſhire, the Clyde, and of Loch Ken in Galloway, where it is ſaid grear numbers of pearls are fiſhed in dry ſummers, many of which ſell from one ſhilling to one guinea. But the greateſt pearl-fiſhery which has ever been eſtabliſhed in Scotland, of which there is any record, is that of the river Tay, about 30 years ago. The pearl-muſſel is found in every part of this river, from its ſource in Loch Tay, to its junction with the ſea. In different parts of the river, but particularly in the vicinity of Perth, we are informed, that not leſs than 11,000l. worth of pearls were ſent to London between the years 1761 and 1764. They were ſold from 10s. to 1l. 16s. per ounce. About this time one pearl was found which weighed 33 grs. This fiſhery, however, as well as the pearl-fiſhery in the other rivers of Scotland, ſeems to be greatly exhauſted, and very probably, as it has been ſuppoſed, from the improvident avarice of the undertakers, not allowing the animal to arrive at that age which ſeems to be neceſſary for the production of pearl.

141 In Ceylon. But the pearl-fiſhery of the warmer climates, in different places of the Eaſt Indies, in the gulf of Perſia, and the Red ſea, and particularly that which is annually carried on in the bay of Condatchy, in the iſland of Ceylon, is by far the moſt extenſive and moſt important of any in the world. The latter, of which we have given a detailed account in the deſcription of CEYLON, and to which we refer our readers, has been under the inſpection of government ſince it fell into the hands of the Britiſh, as it was under that of the Portugueſe and Dutch, its former maſters. To the Dutch, it is ſaid, while they were in poſſeſſion of the iſland, this fiſhery brought an annual tribute of 20,000l. To the account which has been already given of this fiſhery, we may add the following, from the Aſiatic Annual Regiſter for the year 1800.

"The perſon who farmed the pearl-fiſhery at Ceylon, laſt year, was a Tamu merchant, who for the privilege of fiſhing with more than the uſual number of donies or boats, paid between two and three hundred thouſand Porto Novo pagodas (D), a ſum nearly double the uſual rent. His excellency the honourable Mr North, by the laſt ſhips from Ceylon, has tranſmitted a very minute detail of the fiſhery in all its ſtages, ſome of which are truly ſingular and remarkable. It appears that the fear of ſharks is the cauſe of a great deal of interruption to the fiſhery, the divers being extremely timid and ſuperſtitious; every one of them, even the moſt expert, entertain a dread of ſharks, and will not on any account deſcend until the conjuror has performed his ceremonies. This prejudice is ſo deeply rooted in their minds, that the government was obliged to keep two ſuch conjurors in their pay, to remove the fears of the divers. The manner of enchanting conſiſts of a number of prayers learned by heart, that nobody, probably not even the conjuror himſelf, underſtands, which he, ſtanding on the ſhore, continues muttering and grumbling from ſunriſe until the boats return. During this period, they are obliged to abſtain from food and ſleep, otherwiſe their prayers would be of no avail: they are, however, allowed to drink, which privilege they indulge in a high degree, and are frequently ſo giddy as to be rendered very unfit for devotion. Some of theſe conjurors accompany the divers in their boats, which pleaſes them very much, as they have their protectors near at hand. Nevertheleſs, I was told, ſaid Mr North, that in one of the preceding fiſheries, a diver loſt his leg by a ſhark; and when the head conjuror was called to an account for the accident, he replied, that an old witch had juſt come from the coaſt, who, from envy and malice, had cauſed this diſaſter by a counter-conjuration, which made fruitleſs his ſkill, and which he was informed of too late; but he afterwards ſhewed his ſuperiority, by enchanting the ſharks ſo effectually, that, though they appeared to moſt of the divers, they were unable to open their mouths. During my ſtay, continues Mr North, at Condatchy, no accident of this kind happened. If a ſhark is ſeen, the divers inſtantly make a ſignal, which on perceiving all the boats return immediately. A diver who trod upon a hammer oyſter, and was ſomewhat wounded, thought he was bit by a ſhark; conſequently made the uſual ſignal, which cauſed all the boats to return; for which miſtake he was afterwards puniſhed. The largeſt and moſt perfect pearl taken laſt ſeaſon, was about the ſize of a ſmall piſtol bullet."

SECT. III. *Of the Methods of Poliſhing Shells.*

THE art of poliſhing ſhells has but lately reached its preſent ſtate of perfection; and as the admiration of ſea ſhells has become ſo general, it may be expected that we ſhould give ſome inſtructions in the means of adding to their natural beauty.

142 Methods employed. Among the immenſe variety of ſhells with which we are acquainted, ſome are taken up out of the ſea, or found on its ſhores, in all their perfection and beauty; their colours being all diſpoſed by nature upon the ſurface, and their natural poliſh ſuperior to any thing that art could give. Where nature is in herſelf thus perfect, it were madneſs to attempt to add any thing to her charms: but in others, where the beauties are latent and covered with a coarſer outer ſkin, art is to be called in; and the outer veil being taken off, all the internal beauties appear.

Among the ſhells which are found naturally poliſhed are the porcelains, or cowries; the caſſanders; the dolia, or conchæ globoſæ, or tuns; ſome buccina; the volutes and the cylinders, or olives, or, as they are generally though improperly called, the *rhombi;* excepting only two or three, as the tiara, the plumb, and the butter-tub

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(D) Perhaps near 100,000l. ſterling. The pagoda is from 7s. to 8s. 6d. ſterling.

butter-tub rhombus, where there is an unpromiſing film on the ſurface, hiding a very great ſhare of beauty within. Though the generality of the ſhells of theſe genera are taken out of the ſea in all their beauty, and in their utmoſt natural poliſh, there are ſeveral other genera, in which all or moſt of the ſpecies are taken up naturally rough and foul, and covered with an epidermis, or coarſe outer ſkin, which is in many rough and downy or hairy. The tellinæ, the muſſels, the cochleæ, and many others, are of this kind. The more nice collectors, as naturaliſts, inſiſt upon having all their ſhells in their native and genuine appearance, as they are found when living at ſea; but others who make collections, hate the diſagreeable outſides, and will have all ſuch poliſhed. It would be very adviſable, however, for both kinds of collectors to have the ſame ſhells in different ſpecimens both rough and poliſhed: the naturaliſt would by this means, beſides knowing the outſide of the ſhell, be better acquainted with its internal characters than he otherwiſe could be; while thoſe who wiſh to have them poliſhed, might compare the beauties of the ſhell, in its wrought ſtate, to its coarſe appearance as nature gives it. How many elegancies in this part of the creation muſt be wholly loſt to us, if it were not for the aſſiſtance of an art of this kind! Many ſhells in their native ſtate are like rough diamonds; and we can form no juſt idea of their beauties till they have been poliſhed and wrought into form.

Though the art of poliſhing ſhells is a very valuable one, yet it is very dangerous to the ſhells; for without the utmoſt care, the means uſed to poliſh and beautify a ſhell often wholly deſtroy it. When a ſhell is to be poliſhed, the firſt thing to be examined, is whether it have naturally a ſmooth ſurface, or be covered with tubercles and prominences.

143 With leather.

A ſhell which has a ſmooth ſurface, and a natural dull poliſh, need only be rubbed with the hand, or with a piece of chamoy leather, with ſome tripoli, or fine rotten ſtone, and it will become of a perfectly bright and fine poliſh. Emery is not to be uſed on this occaſion, becauſe it wears away too much of the ſhell. This operation requires the hand of an experienced perſon, that knows how ſuperficial the work muſt be, and where he is to ſtop; for in many of theſe ſhells the lines are only on the ſurface, and the wearing away ever ſo little of the ſhell defaces them. A ſhell that is rough, foul, and cruſty, or covered with a tartareous coat, muſt be left a whole day ſteeping in hot water: when it has imbibed a large quantity of this, it is to be rubbed with rough emery on a ſtick, or with the blade of a knife, in order to get off the coat. After this, it may be dipped in diluted aquafortis, ſpirit of ſalt, or any other acid; and after remaining a few moments in it, be again plunged into common water. This will add greatly to the ſpeed of the work. After this it is to be well rubbed with linen cloths, impregnated with common ſoap; and when by theſe ſeveral means it is made perfectly clean, the poliſhing is to be finiſhed with fine emery and a hair-bruſh. If after this the ſhell when dry appears not to have ſo good a poliſh as was deſired, it muſt be rubbed over with a ſolution of gum arabic; and this will add greatly to its gloſs, without doing it the ſmalleſt injury. The gum-water muſt not be too thick, and then it gives no ſenſible coat, only heightening the colours. The white of an egg anſwers this purpoſe alſo very well; but it is ſubject to turn yellow. If the ſhell has an epidermis, which will by no means admit the poliſhing of it, it is to be dipped ſeveral times in diluted aquafortis, that this may be eaten off; and then the ſhell is to be poliſhed in the uſual way with putty, fine emery, or tripoli, on the hair of a fine bruſh. When it is only a pellicle that hides the colours, the ſhells muſt be ſteeped in hot water, and after that the ſkin worked off by degrees with an old file. This is the caſe with ſeveral of the cylinders, which have not the natural poliſh of the reſt.

144 With pumice-ſtone.

When a ſhell is covered with a thick and fatty epidermis, as is the caſe with ſeveral of the muſſels and tellinæ; in this caſe aquafortis will do no ſervice, as it will not touch the ſkin: then a rough bruſh and coarſe emery are to be uſed; and if this does not ſucceed, ſeal-ſkin, or, as the workmen call it, *fiſh-ſkin* and *pumice-ſtone*, are to be employed.

When a ſhell has a thick cruſt, which will not give way to any of theſe means, the only way left is to plunge it ſeveral times into ſtrong aquafortis, till the ſtubborn cruſt is wholly eroded. The limpets, auris marina, the helmet-ſhells, and ſeveral other ſpecies of this kind, muſt have this ſort of management; but as the deſign is to ſhow the hidden beauties under the cruſt, and not to deſtroy the natural beauty and poliſh of the inſide of the ſhell, the aquafortis muſt be uſed in this manner: A long piece of wax muſt be provided, and one end of it made perfectly to cover the whole mouth of the ſhell; the other end will then ſerve as a handle, and the mouth being ſtopped by the wax, the liquor cannot get into the inſide to ſpoil it; then there muſt be placed on a table a veſſel full of aquafortis, and another full of common water.

145 With acids, &c.

The ſhell is to be plunged into the aquafortis; and after remaining a few minutes in it, is to be taken out, and plunged into the common water. The progreſs the aquafortis makes in eroding the ſurface is thus to be carefully obſerved every time it is taken out: the point of the ſhell, and any other tender parts, are to be covered with wax, to prevent the aquafortis from eating them away; and if there be any worm-holes, they alſo muſt be ſtopped up with wax, otherwiſe the aquafortis would ſoon eat through in thoſe places. When the repeated dippings into the aquafortis ſhow that the coat is ſufficiently eaten away, then the ſhell is to be wrought carefully with fine emery and a bruſh; and when it is poliſhed as high as can be by this means, it muſt be wiped clean, and rubbed over with gum-water or the white of an egg. In this ſort of work the operator muſt always have the caution to wear gloves; otherwiſe the leaſt touch of the aquafortis will burn the fingers, and turn them yellow; and often, if it be not regarded, will eat off the ſkin and the nails.

Theſe are the methods to be uſed with ſhells which require but a moderate quantity of the ſurface to be taken off; but there are others which require to have a larger quantity removed, and to be uncovered deeper: this is called entirely ſcaling a ſhell. This is done by means of a horizontal wheel of lead or tin, impregnated with rough emery; and the ſhell is wrought down in the ſame manner in which ſtones are wrought by the lapidary. Nothing is more difficult, however, than the performing this work with nicety : very often ſhells are cut down too far by it, and wholly ſpoiled ; and to avoid this, a coarſe vein muſt be often left ſtanding in ſome place, and taken down afterwards with the file, when the cutting it down at the wheel would have ſpoiled the adjacent parts.

After the ſhell is thus cut down to a proper degree, it is to be poliſhed with fine emery, tripoli, or rotten ſtone, with a wooden wheel turned by the ſame machine as the leaden one, or by the common method of working with the hand with the ſame ingredients. When a ſhell is full of tubercles or protuberances which muſt be preſerved, it is then impoſſible to uſe the wheel : and if the common way of dipping into aquafortis be attempted, the tubercles being harder than the reſt of the ſhell, will be corroded before the reſt is ſufficiently ſcaled, and the ſhell will be ſpoiled. In this caſe, induſtry and patience are the only means of effecting a poliſh. A camels-hair pencil muſt be dipped in aquafortis ; and with this the intermediate parts of the ſhell muſt be wetted, leaving the protuberances dry : this is to be often repeated ; and after a few moments the ſhell is always to be plunged into water to ſtop the eroſion of the acid, which would otherwiſe eat too deep, and deſtroy the beauty of the ſhell. When this has ſufficiently taken off the foulneſs of the ſhell, it is to be poliſhed with emery of the fineſt kind, or with tripoli, by means of a ſmall ſtick ; or the common poliſhing-ſtone uſed by the goldſmiths may be uſed.

This is a very tedious and troubleſome thing, eſpecially when the echinated oyſters and murices, and ſome other ſuch ſhells, are to be wrought : and what is worſt of all is, that when all this labour has been employed, the buſineſs is not well done ; for there ſtill remain ſeveral places which could not be reached by any inſtrument, ſo that the ſhell muſt neceſſarily be rubbed over with gum-water or the white of an egg afterwards, in order to bring out the colours and give a gloſs : in ſome caſes it is even neceſſary to give a coat of varniſh.

146
Some ſhells are diſguiſed by poliſhing, ſuch as

These are the means uſed by artiſts to brighten the colours and add to the beauty of ſhells ; and the changes produced by poliſhing in this manner are ſo great, that the ſhell can ſcarcely be known afterwards to be the ſame it was ; and hence we hear of new ſhells in the cabinets of collectors, which have no real exiſtence as ſeparate ſpecies, but are ſhells well known, diſguiſed by poliſhing. To caution the reader againſt errors of this kind, it may be proper to add the moſt remarkable ſpecies thus uſually altered.

147
The onyx-ſhell.

The onyx-ſhell or volute, called the *purple* or *violet-tip*, which in its natural ſtate is of a ſimple pale brown, when it is wrought ſlightly, or poliſhed with juſt the ſuperficies taken off, is of a fine bright yellow ; and when it is eaten away deeper, it appears of a fine milk-white, with the lower part bluiſh : it is in this ſtate that it is called the *onyx-ſhell ;* and it is preſerved in many cabinets in its rough ſtate, and in its yellow appearance, as different ſpecies of ſhells.

148
Violet ſhells.

The *violet ſhell*, ſo common among the curious, is a ſpecies of porcelain, or common cowry, which does not appear in that elegance till it has been poliſhed ; and the common ſea-ear ſhows itſelf in two or three different forms, as it is more or leſs deeply wrought. In its rough ſtate it is duſky and coarſe, of a pale brown on the outſide, and pearly within ; when it is eaten down a little way below the ſurface, it ſhows variegations of black and green ; and when ſtill farther eroded, it appears of a fine pearly hue within and without.

149
Nautilus.

The *nautilus*, when it is poliſhed down, appears all over of a fine pearly colour ; but when it is eaten away but to a ſmall depth, it appears of a fine yellowiſh colour with duſky hairs. The burgau, when entirely cleared of its coat, is of the moſt beautiful pearl colour : but when ſlightly eroded, it appears of a variegated mixture of green and red ; whence it has been called the *parroquet ſhell*. The common helmet-ſhell, when wrought, is of the colour of the fineſt agate ; and the muſſels, in general, though very plain ſhells in their common appearance, become very beautiful when poliſhed, and ſhow large veins of the moſt elegant colours. The Perſian ſhell, in its natural ſtate, is all over white, and covered with tubercles ; but when it has been ground down on a wheel, and poliſhed, it appears of a gray colour, with ſpots and veins of a very bright and highly poliſhed white. The limpets, in general, become very different when poliſhed, moſt of them ſhowing very elegant colours ; among theſe the tortoiſe-ſhell limpet is the principal : it does not appear at all of that colour or tranſparence till it has been wrought.

150
Jonquil-chama.

That elegant ſpecies of ſhell called the *jonquil-chama*, which has deceived ſo many judges of theſe things into an opinion of its being a new ſpecies, is only a white chama with a reticulated ſurface ; but when this is poliſhed, it loſes at once its reticular work and its colour, and becomes perfectly ſmooth, and of a fine bright yellow. The violet-coloured chama of New England, when worked down and poliſhed, is of a fine milk-white, with a great number of blue veins, diſpoſed like the variegations in agates.

151
The aſſes-ear ſhell.

The *aſſes-ear ſhell*, when poliſhed after working it down with the file, becomes extremely gloſſy, and obtains a fine roſe-colour all about the mouth. Theſe are ſome of the moſt frequent among an endleſs variety of changes wrought on ſhells by poliſhing ; and we find there are many of the very greateſt beauties of this part of the creation which muſt have been loſt but for this method of ſearching deep in the ſubſtance of the ſhell for them.

152
Dutch method of poliſhing ſhells.

The Dutch are very fond of ſhells, and are very nice in their manner of working them ; they are under no reſtraint, however, in their works ; but uſe the moſt violent methods, ſo as often to deſtroy all the beauty of the ſhell. They file them down on all ſides, and often take them to the wheel, when it muſt deſtroy the very characters of the ſpecies. Nor do they ſtop here : but determined to have beauty at any rate, they are for improving upon nature, and frequently add ſome lines and colours with a pencil, afterwards covering them with a fine coat of varniſh, ſo that they ſeem the natural lineations of the ſhell : the Dutch cabinets are by theſe means made very beautiful, but they are by no means to be regarded as inſtructors in natural hiſtory. There are ſome artificers of this nation who have a way of covering ſhells all over with a different tinge from that which nature gives them ; and the curious are often enticed by theſe tricks to purchaſe them for new ſpecies.

There

Of the Habitation of Shells, &c.

There is another kind of work beſtowed on certain ſpecies of ſhells, particularly the nautilus; namely, the engraving on it lines and circles, and figures of ſtars, and other things. This is too obvious a work of art to ſuffer any one to ſuppoſe it natural. Buonani has figured ſeveral of theſe wrought ſhells at the end of his work; but this was applying his labour to very little purpoſe; the ſhells are ſpoiled as objects of natural hiſtory by it.—They are principally done in the Eaſt Indies.

153 Imperfections of ſhells natural and accidental.

Shells are ſubject to ſeveral imperfections; ſome of which are natural and others accidental. The natural defects are the effect of age, or ſickneſs in the fiſh. The greateſt miſchief happens to ſhells by the fiſh dying in them. The curious in theſe things pretend to be always able to diſtinguiſh a ſhell taken up with the fiſh alive from one found on the ſhores: they call the firſt a *living*, the ſecond a *dead* ſhell; and ſay that the colours are always much fainter in the dead ſhells. When the ſhells have lain long dead on the ſhores, they are ſubject to many injuries, of which the being eaten by ſea-worms is not the leaſt; age renders the fineſt ſhells livid or dead in their colours.

Beſides the imperfections ariſing from age and ſickneſs in the fiſh, ſhells are ſubject to other deformities, ſuch as morbid cavities, or protuberances, in parts where there ſhould be none. When the ſhell is valuable, theſe faults may be hid, and much added to the beauty of the ſpecimen, without at all injuring it as an object of natural hiſtory, which ſhould always be the great end of collecting theſe things. The cavities may be filled up with maſtic, diſſolved in ſpirit of wine, or with iſinglaſs: theſe ſubſtances muſt be either coloured to the tinge of the ſhell, or elſe a pencil dipped in water-colours muſt finiſh them up to the reſemblance of the reſt; and then the whole ſhell being rubbed over with gum-water, or with the white of an egg, ſcarce any eye can perceive the artifice: the ſame ſubſtances may alſo be uſed to repair the battered edge of a ſhell, provided the pieces chipped off be not too large. And when the excreſcences of a ſhell are faulty, they are to be taken down with a fine file. If the lip of a ſhell be ſo battered that it will not admit of repairing by any cement, the whole muſt be filed down or ground on the wheel till it become even.

EXPLANATION OF PLATES.

PLATE CLII. ANIMALS INHABITING SHELLS.

Fig. 1. *Chiton aculeatus.* Under part ſhewing the briſtly fringe.

Fig. 2. Animal inhabiting *Lepas tintinnabulum.*

Fig. 3. *Lepas balanus.*

Fig. 4. *Lepas anatifera.*

Fig. 5. Animal inhabiting the genus *Pholas.*

Fig. 6. Animal inhabiting the *Mya.*

Fig. 7. Animal inhabiting the *Solen.*

Fig. 8. Animal of the *Tellina.*

Fig. 9. Animal of the *Cardium.*

Fig. 10. Animal of the *Mactra.*

Fig. 11. Animal inhabiting the *Donax.*

Fig. 12. Animal inhabiting the *Venus.*

Fig. 13. Animal of the *Oſtrea.*

Fig. 14. *Chiton aculeatus.* Shell with 8 valves; *a*, *a*, the valves longitudinally arranged, and incumbent on the back; *b*, *b*, the rounded ſides.

Fig. 15. *Lepas anatifera.* Shell having 5 valves; *a*, the larger valves nearly quadrangular; *b*, the leſſer valves nearly triangular, at the apex of the ſhell; *c*, the ſolitary valve, rounded, acute.

Fig. 16. *Pholas dactylus.* The ſhell is bivalve, with *a*, *a*, *a*, three ſubſidiary valves; *b*, *b*, the upper extremity dotted like net-work; *c*, *c*, the ſuperior tranſverſely ſtriated.

PLATE CLIII.

Fig. 17. *Mya margaritifera*, the pearl-bearing muſſel.

Fig. 18. *Solen radiatus*, radiated ſolen.

Fig. 19. *Tellina radiata*, radiated tellina.

Fig. 20. *Cardium cardiſſa*, Venus heart cockle; *a*, *a*, beaks approaching to each other.

Fig. 21. *Mactra ſtultorum*, ſimple mactra.

Fig. 22. *Donax denticulata*, denticulated donax.

Fig. 23. *Venus fimbriata*, bordered Venus ſhell.

Fig. 24. *Spondylus gædaropus*, ſtilt ſpondylus.

Fig. 25. *Chama gigas*, giant chama, or gaping cockle.—This is the largeſt ſhell known.

PLATE CLIV.

Fig. 26. *Arca Noæ*, Noah's ark.

Fig. 27. *Oſtrea pallium*, the ducal-mantle pecten.

Fig. 28. *Anomia ephippium.*

Fig. 29. *Mytilus margaritiferus*, pearl-bearing muſſel, or pearl-oyſter of the Eaſt Indies.

Fig. 30. *Pinna muricata*, muricated ſea-wing.

Fig. 31. *Argonauta argo*, paper nautilus; *a*, *a*, the ſhell; *b*, *b*, *b*, *b*, *b*, the animal protruded from the ſhell, as it moves on the ſurface of the water.

PLATE CLV.

Fig. 32. *Nautilus beccarii*, chambered nautilus. A ſection of the ſhell; *a*, *a*, *a*, the genicula; *b*, *b*, *b*, the articulations; *d*, *d*, the lateral ſyphon.

Fig. 33. *Cypræa lynx; a*, *a*, the lips turned in and toothed; *b*, the linear aperture.

Fig. 34. *Cypræa moneta*, cowrie; *a*, *a*, knobbed margin; *b*, back gibbous; *e*, *e*, prominences inſtead of a ſpire.

Fig. 35. *Bulla ampullacea; a*, back without ſpire; *b*, vertex umbilicated.

Fig. 36. *Voluta muſica; a*, venter, marked with interrupted lines; *b*, baſe emarginated; *c*, *c*, wreaths crowned at the ſutures with obtuſe ſpines; *d*, *d*, columella or pillar, plaited; *e*, *e*, outer lip, ſmooth.

Fig. 37. *Buccinum harpa*, muſical-harp ſhell; *a*, dilated venter; *b*, *b*, *b*, longitudinal varices, crowned with *c*, *c*, *c*, ſharp ſpines.

Fig. 38. *Buccinum undatum.*

Fig. 39. *Strombus ſcorpio*, ſcorpion ſtrombus; *a*, *a*, *a*, back with knobby cingula and waved ſtriæ; *b*, ſpire conical; *c*, *c*, elevated ſutures; *d*, *d*, waved margin of the lip; *e*, *e*, caudal digitus; *f*, *f*, lateral digiti.

Explanation of the Plates.

Fig. 40. *Murex tribulus*, thorny woodcock.

Fig. 41. *Trochus teleſcopium*, teleſcope-top ſhell; *a*, the baſe; *b*, pillar projecting, ſpiral; *c*, outer lip dilated.

Fig. 42. *Turbo ſcalaris*, wentle-trap; *a*, *a*, cancellated wreaths; *b*, *b*, membranaceous cingula; *c*, ſpire acute, papillary; *d*, aperture circular; *e*, *e*, lip reflexed.

Fig. 43. *Helix luſitanica*; *a*, umbilicus; *b*, *b*, *b*, round venter; *c*, cloſed, ſemilunar aperture.

Fig. 44. *Helix decollata.*

Fig. 45. *Nerita canrena*; *a*, umbilicus gibbous, deep; *b*, *b*, outer lip dilated, arched, entire; *c*, lip of the pillar tranſverſe, truncated.

Fig. 46. *Haliotis varia*; *a*, *a*, ribs acute, and ſtriated croſswiſe; *b*, lateral ſpire, with its margin dentated.

Fig. 47. *Patella ſaccharina*; *a*, *a*, ſeven ridged acute ribs; *b*, obtuſe vertex.

Fig. 48. *Dentalium arcuatum*, arched tooth-ſhell.

Fig. 49. *Serpula glomerata*,

Fig. 50. *Teredo navalis*, ſhip-worm.

Fig. 51. *Sabella alveolata.*

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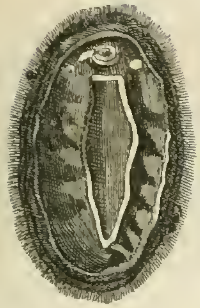

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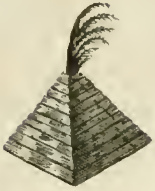

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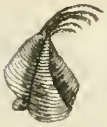

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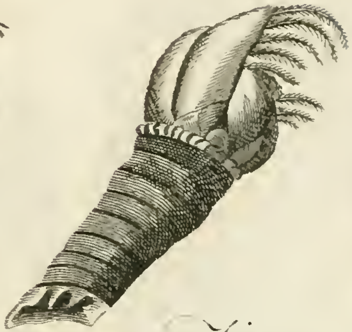

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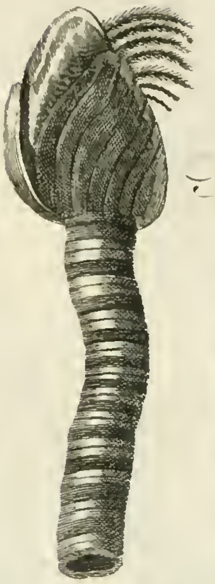

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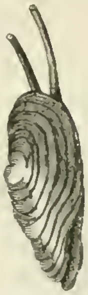

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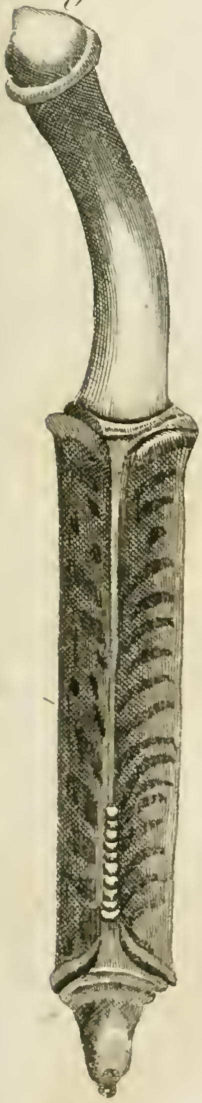

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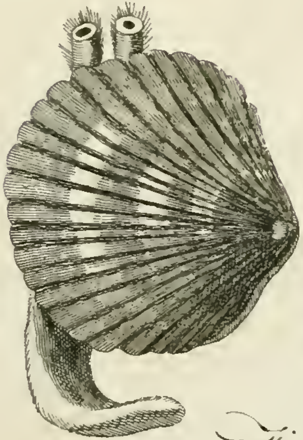

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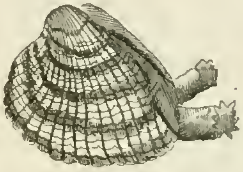

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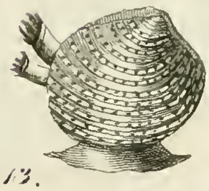

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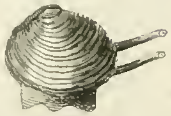

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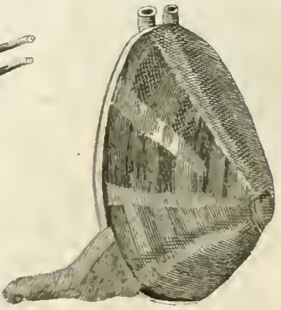

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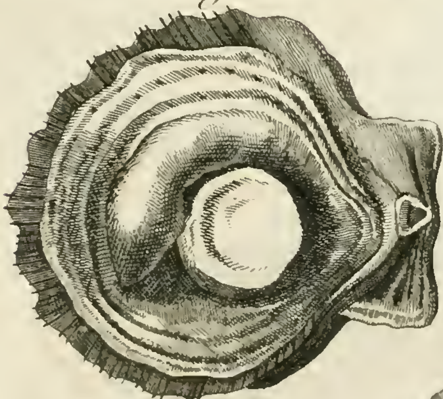

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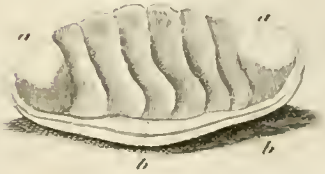

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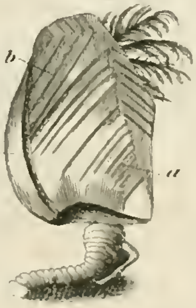

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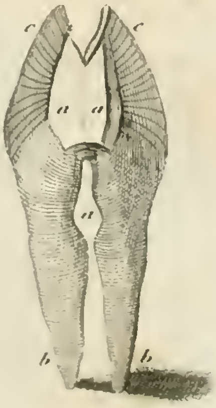

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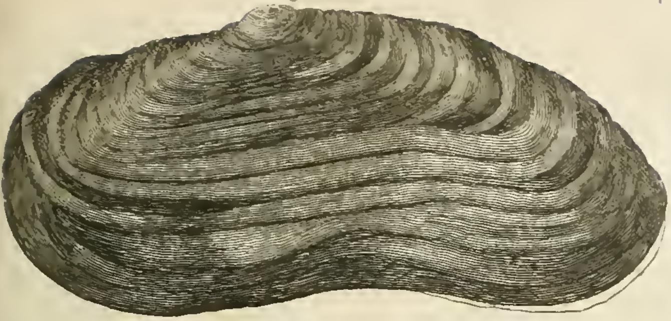

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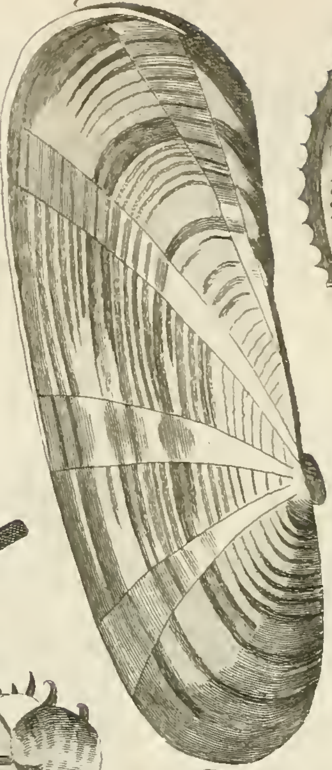

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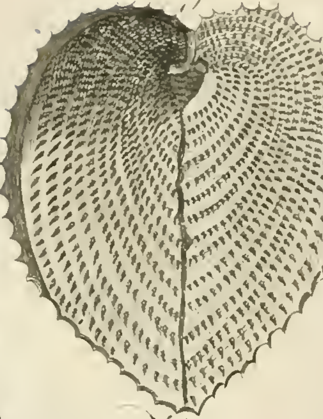

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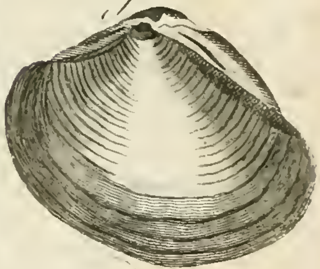

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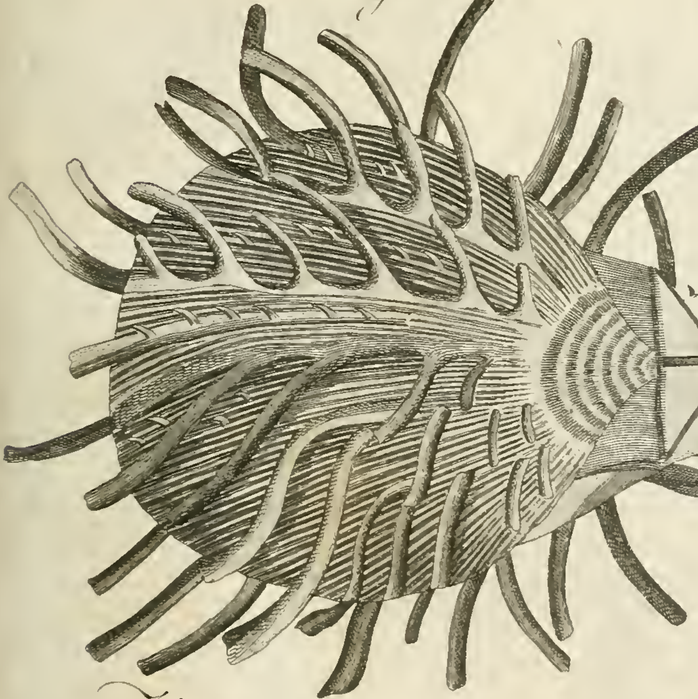

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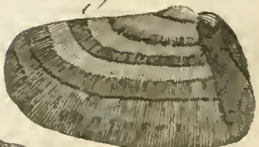

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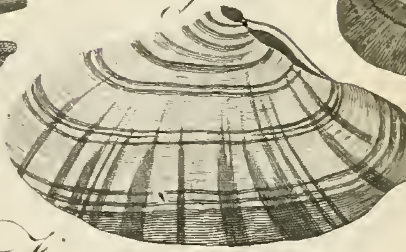

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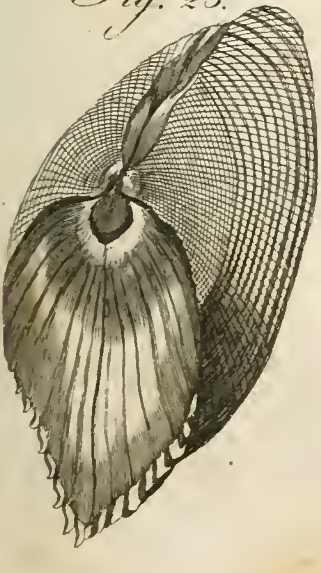

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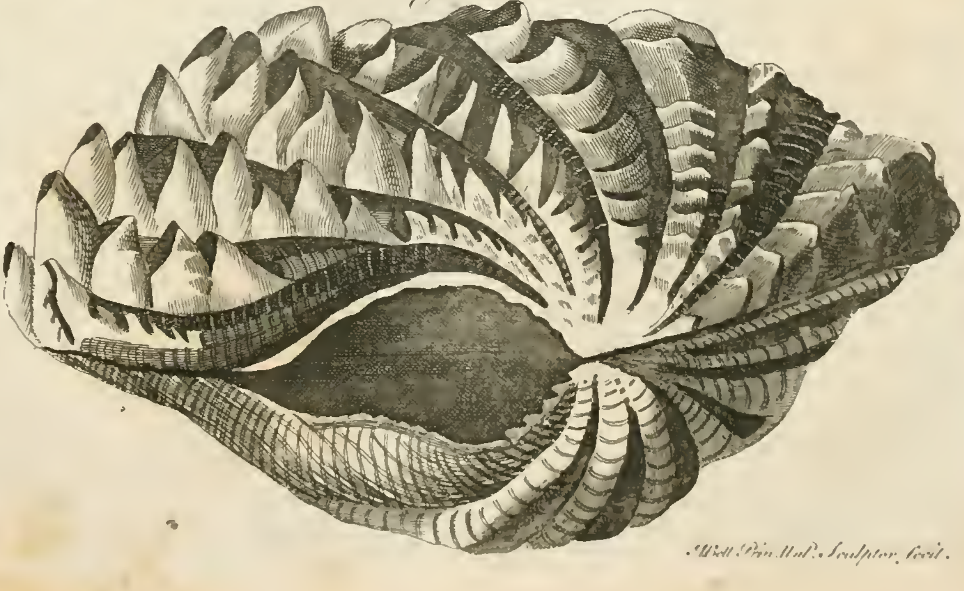

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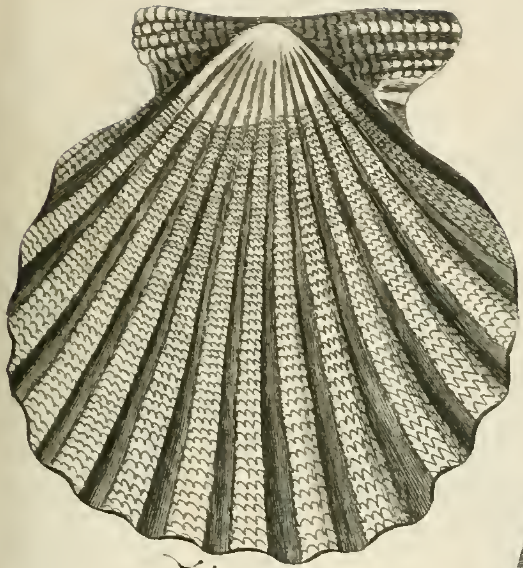

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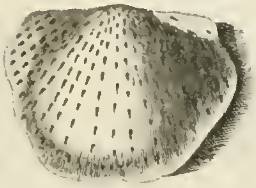

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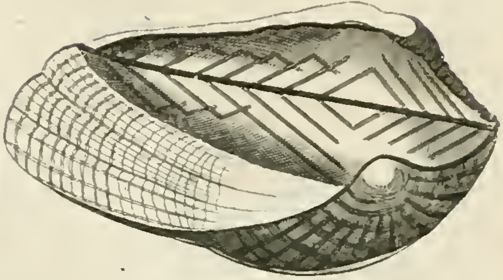

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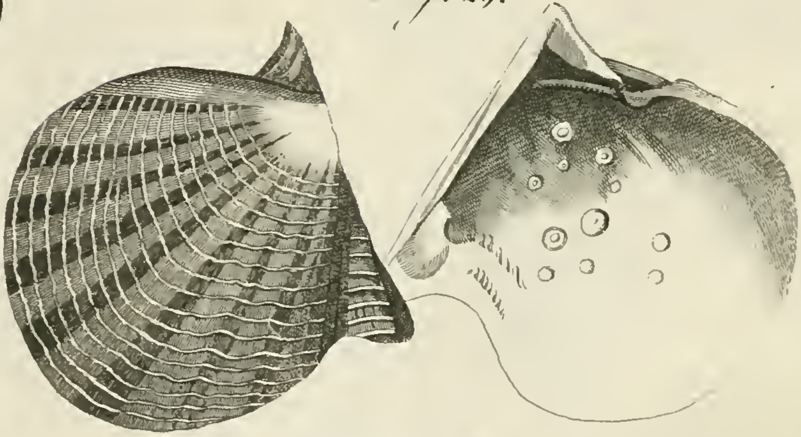

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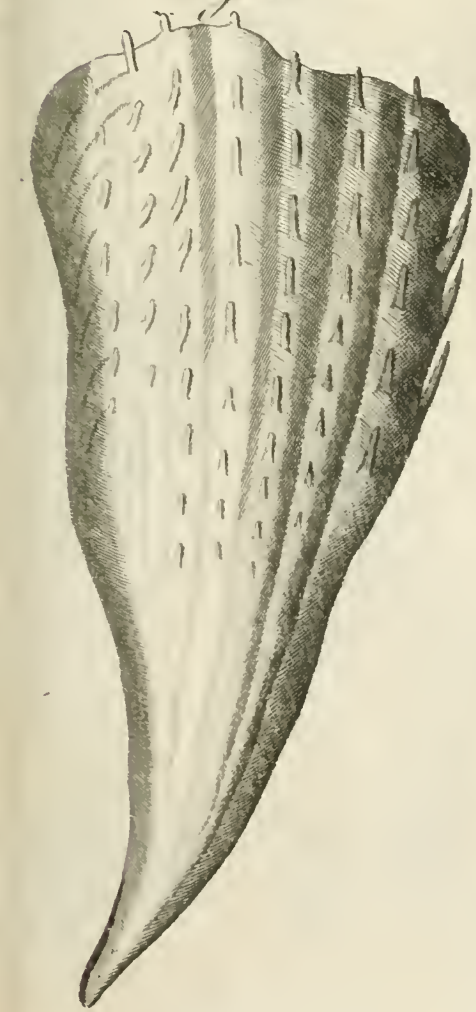

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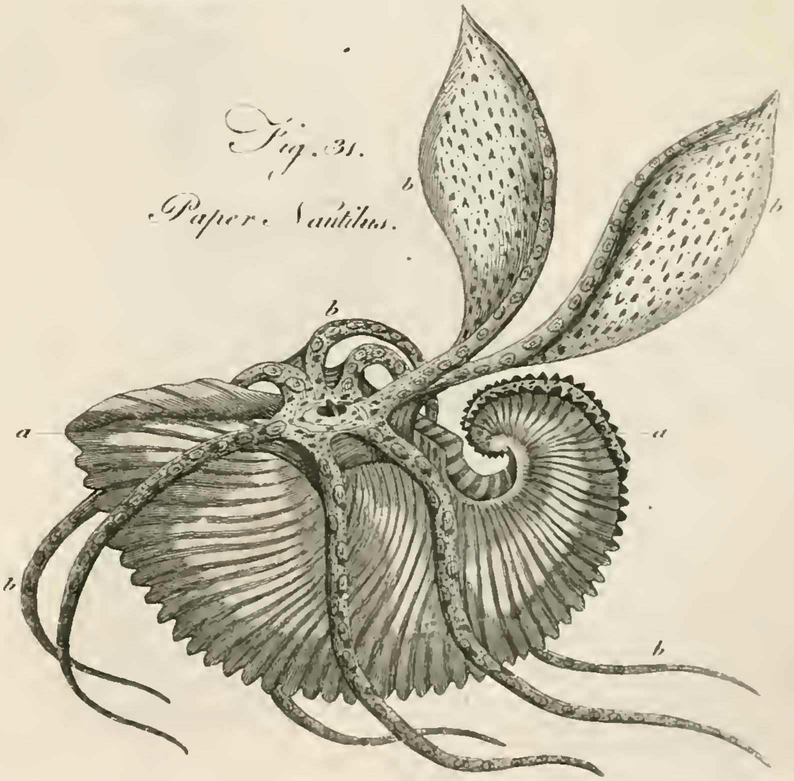

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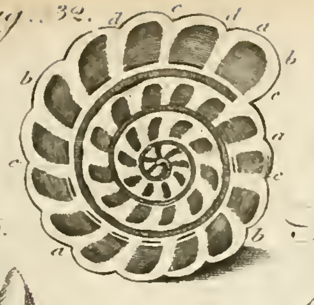

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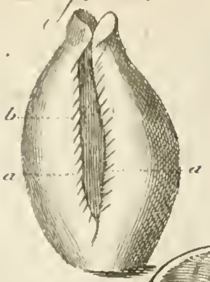

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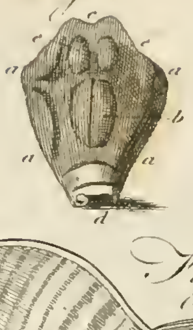

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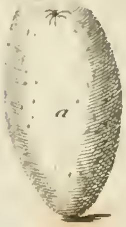

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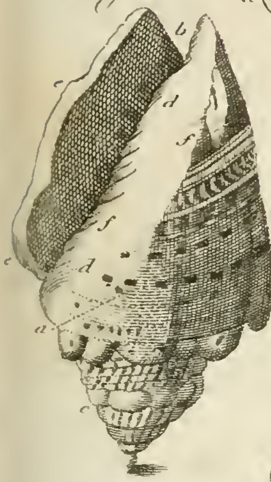

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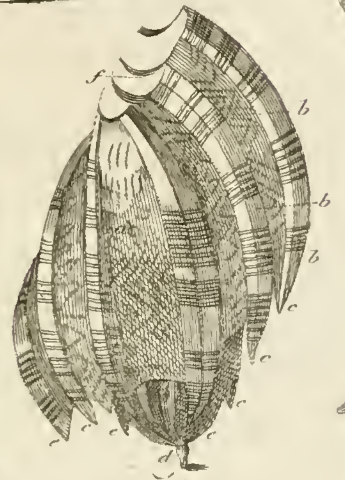

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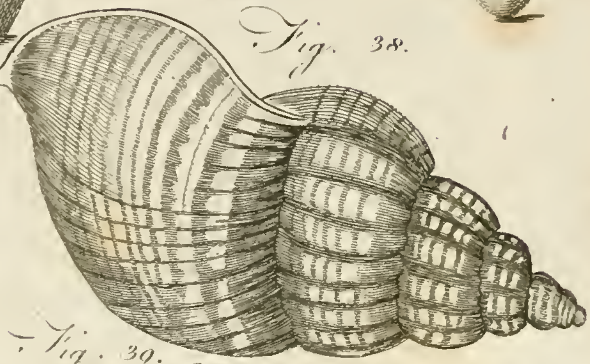

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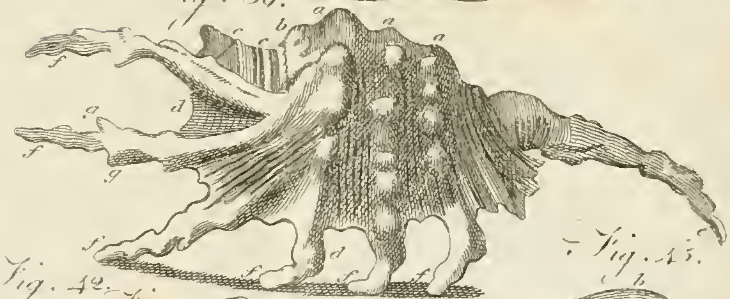

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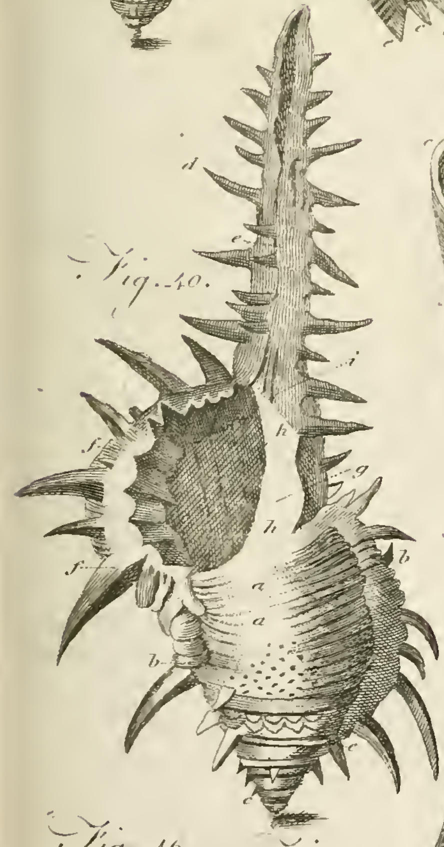

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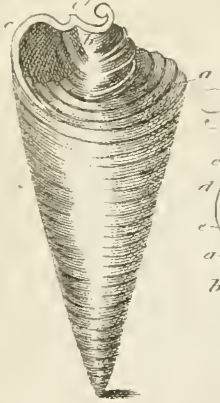

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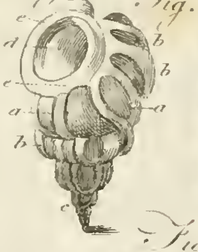

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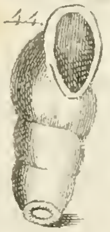

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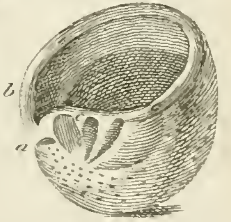

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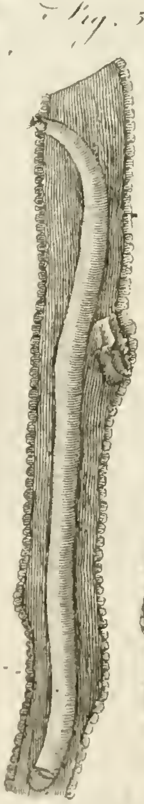

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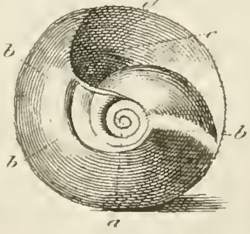

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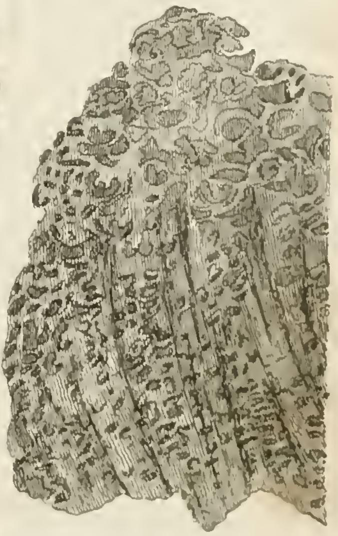

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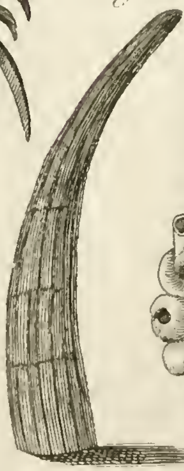

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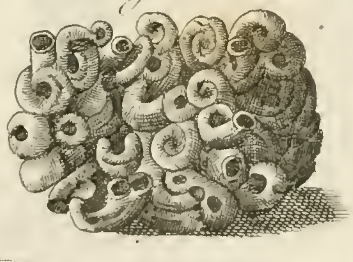


Fig. 46.

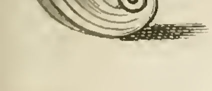
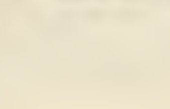


Fig. 47.



A. Bell Prin. Wal. Sculptor fecit.

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CONCHYLIA, a general name for all petrified ſhells, as limpets, cochleæ, nautili, conchæ, lepades, &c.

CONCIATOR, in the glaſs art, is, for the cryſtal-glaſs, what the founder is at the green-glaſs houſes. He is the perſon that weighs and proportions the ſalt on aſhes and ſand, and works them with a ſtrong fire till they run into lumps and become white; and if the metal be too hard, and conſequently brittle, he adds ſalt or aſhes, and if too ſoft, ſand; ſtill mixing them to a fit temper, which is only known by the working.

CONCINNOUS intervals, in *Muſic*, are ſuch as are fit for muſic, next to, and in combination with, concords; being neither very agreeable not diſagreeable in themſelves; but having a good effect, as by their oppoſition they heighten the more eſſential principles of pleaſure: or as, by their mixture and combination with them, they produce a variety neceſſary to our being better pleaſed.

Concinnous Syſtem, in *Muſic*. A ſyſtem is ſaid to be concinnous, or divided concinnouſly, when its parts, conſidered as ſimple intervals, are concinnous; and are beſides placed in ſuch an order between the extremes, as that the ſucceſſion of ſounds, from one extreme to the other, may have an agreeable effect.

CONCLAMATIO, in antiquity, a ſhout raiſed by thoſe preſent at burning the dead, before they ſet fire to the funeral pile. See Shout. The word was alſo applied to the ſignal given to the Roman ſoldiers to decamp, whence the expreſſion *conclamare vaſa; conclamare arma*, was a ſignal for battle. It was likewiſe uſed for a practice of calling to a perſon deceaſed three times by his name; and when no reply was returned, they thus expreſſed his deceaſe, *conclamatum eſt*. Whence the ſame term was afterwards applied to the ceſſation of the Roman empire.

CONCLAVE, the place in which the cardinals of the Romiſh church meet, and are ſhut up, in order to the election of a pope.

The conclave is a range of ſmall cells, 10 feet ſquare, made of wainſcot: theſe are numbered, and drawn for by lot. They ſtand in a line along the galleries and hall of the Vatican, with a ſmall ſpace between each. Every cell has the arms of the cardinal over it. The conclave is not fixed to any one determinate place, for the conſtitutions of the church allow the cardinals to make choice of ſuch a place for the conclave as they think moſt convenient; yet it is generally held in the Vatican.

The conclave is very ſtrictly guarded by troops; neither the cardinals, nor any perſon ſhut up in the conclave, are ſpoken to, but at the hours allowed of, and then in Italian or Latin: even the proviſions for the conclave are examined, that no letters be conveyed by that means from the miniſters of foreign powers, or other perſons who may have an intereſt in the election of the pontiff.

Conclave is alſo uſed for the aſſembly, or meeting, of the cardinals ſhut up for the election of a pope.

CONCLUSION, in *Logic*, the conſequences or judgment drawn from what was aſſerted in the premiſes; or the previous judgments in reaſoning, gained from combining the extreme ideas between themſelves.

CONCOCTION, in *Medicine*, the change which the food undergoes in the ſtomach, &c. to become chyle. See Chyle.

CONCOMITANT, ſomething that accompanies or goes along with another.

CONCORD, in *Grammar*, that part of conſtruction called *ſyntax*, in which the words of a ſentence agree; that is, in which nouns are put in the ſame gender, number, and caſe; and verbs in the ſame number and perſon with nouns and pronouns. See Grammar.

Concord, in *Muſic*, the relation of two ſounds that are always agreeable to the ear, whether applied in ſucceſſion or conſonance.

Form of Concord, in eccleſiaſtical hiſtory, a ſtandard-book among the Lutherans, compoſed at Torgaw, in 1576, and thence called the book of Torgaw, and reviewed at Berg by ſix Lutheran doctors of Germany, the principal of whom was James Andreæ. This book contains, in two parts, a ſyſtem of doctrine, the ſubſcription of which was a condition of communion, and a formal and very ſevere condemnation of all who differed from the compilers of it, particularly with reſpect to the majeſty and omnipreſence of Chriſt's body, and the real manducation of his fleſh and blood in the euchariſt. It was firſt impoſed on the Saxons by Auguſtus, and occaſioned great oppoſition and diſturbance. The diſpute about it was revived in Switzerland in 1718, when the magiſtrates of Bern publiſhed an order for adopting it as the rule of faith; the conſequence of which was a conteſt, that reduced its credit and authority.

CONCORDANCE, a dictionary or index to the Bible, wherein all the leading words, uſed in the courſe of the inſpired writings, are ranged alphabetically; and the various places where they occur referred to; to aſſiſt in finding out paſſages, and comparing the ſeveral ſignifications of the ſame word.

Cardinal Hugo de St Charo, is ſaid to have employed 500 monks at the ſame time in compiling a Latin concordance; beſides which, we have ſeveral other concordances in the ſame language; one, in particular, called the *concordance* of England, compiled by J. Darlington, of the order of Predicants; another more accurate one, by the Jeſuit de Zamora.

R. Mordecai Nathan has furniſhed us with a Hebrew concordance, firſt printed at Venice in 1523, containing all the Hebrew roots branched into their various ſignifications, and under each ſignification all the places in ſcripture wherein it occurs: but the beſt and moſt uſeful Hebrew concordance is that of Buxtorf, printed at Baſil in 1632.

Dr Taylor publiſhed, in 1754, a Hebrew concordance in two volumes folio, adapted to the Engliſh Bible, and diſpoſed after the manner of Buxtorf.

The Greek concordances are only for the New Teſtament: indeed we have one of Conr. Kircher's on the Old; but this is rather a concordantial dictionary than a concordance; containing all the Hebrew words in an alphabetical order; and underneath all the interpretations or ſenſes the LXX. give them; and in each interpretation, all the places where they occur in that verſion.

In 1718, Trommius publiſhed his Greek concordance for the Septuagint at Amſterdam, in two volumes folio; and Schmidius improving on a ſimilar work of H. Stephen, has given an excellent Greek concordance for the New Teſtament, the beſt edition of which is that of Leipſic, an. 1717.

Calaſius, an Italian Cordelier, has given us concordances of the Hebrew, Latin, and Greek, in two columns; the firſt, which is Hebrew, is that of R. Mordecai Nathan, word for word, and according to the order of the books and chapters: in the other column is a Latin interpretation of each paſſage of Scripture quoted by R. Mordecai; this interpretation is Calaſius's own; but in the margin he adds that of the LXX. and the Vulgate, when different from his. The work is in 4 vols folio, printed at Rome in 1621.

We have ſeveral very copious concordances in Engliſh, as Newmann's, &c. but the laſt and beſt eſteemed is that in 4to by Alexander Cruden.

CONCORDANT verses, ſuch as have ſeveral words in common; but which, by the addition of other words, convey an oppoſite, at leaſt a different meaning. Such are thoſe.

$$\textit{Et}\left\{\begin{array}{l}\textit{canis}\\ \textit{lupus}\end{array}\right\}\ \textit{in ſilva}\ \left\{\begin{array}{l}\textit{venatur}\\ \textit{nutritur}\end{array}\right\}\ \textit{et omnia}\ \left\{\begin{array}{l}\textit{ſervat.}\\ \textit{vaſtat.}\end{array}\right.$$

CONCORDAT, in the canon law, denotes a covenant or agreement concerning ſome beneficiary matter, as a reſignation, permutation, promotion, or the like.

The council of Trent, ſeſſ. vi. *de reform.* cap. 4. ſpeaking of concordats made without the authority and approbation of the pope, calls them *concordias quæ tantum ſuos obligant auctores, non ſucceſſores.* And the congregation of cardinals, who have explained this decree, declares alſo that a concordat cannot be valid ſo as to bind ſucceſſors, unleſs confirmed by the pope.

Concordat is alſo uſed, abſolutely, among the French, for an agreement concluded at Bologna in 1516, between Pope Leo X. and Francis I. of France, for regulating the manner of nominating to benefices.

The concordat ſerves in lieu of the pragmatic ſanction, which has been abrogated; or, rather, it is the pragmatic ſanction ſoftened and reformed. The concordat between the pope and the republic of Venice reſembles the former.

There is alſo a German concordat, made between the emperor Frederic III. and the princes of Germany, in 1448, relating to beneficiary matters, confirmed by Pope Nicholas V.

CONCORDIA, a town of Italy, in the duchy of Mirandola; ſeated on the river Sechia, 5 miles weſt of Mirandola, and 15 miles ſouth-eaſt of Mantua; ſubject to the houſe of Auſtria. E. Long. 11. 13. N. Lat. 44. 52.

Concordia, in *Ancient Geography*, a town of the Veneti, ſituated at the confluence of the rivers Romatinus Major and Minor, 31 miles to the weſt of Aquileia, (Pliny, Ptolemy, Antonine); a colony ſurnamed *Julia.* Its ruins ſtill go by the name of *Concordia.*—Another Concordia (Ptolemy), of Luſitania, to the north-weſt of Trajan's bridge, on the Tagus.—A third of the Nemetes in Belgica, on the weſt ſide of the Rhine; a Roman fortreſs, ſituated between Brocomagus and Noviomagus. Now Druſenheim, in Alſace. E. Long. 8. N. Lat. 48. 40.

Concordia, a Pagan divinity of the Romans. She had a temple on the declivity of the Capitol; another in the Portico of Livia; and a third on Mount Palatine, built of braſs by Cn. Flavius, on account of a vow made for reconciling the ſenate and people. She was pictured with a cup in her right hand; in her left was ſometimes a ſceptre, and ſometimes a *cornucopia.* Her ſymbols were two hands joined, as is ſeen in a coin of Aurelius Verus, and another of Nero; alſo two ſerpents twiſting about a caduceus. She was addreſſed to promote the peace and union of families and citizens.

CONCOU, in *Botany*, a name given by the people of Guinea to an herb, which is in great eſteem among them for killing that troubleſome ſort of worm called the *Guinea-worm*, that breeds in their fleſh. They bruiſe the leaves, and mixing them with oil apply them in form of a cataplaſm.

CONCRETE, in the ſchool-philoſophy, an aſſemblage or compound.

Concrete, in *Natural Philoſophy* and *Chemiſtry*, ſignifies a body made up of different principles, or any mixed body: thus, ſoap is a factitious concrete, mixed together by art; and antimony is a natural concrete, or a mixed body compounded in the bowels of the earth.

CONCRETION, the uniting ſeveral ſmall particles of a natural body into ſenſible maſſes or concretes, whereby it becomes ſo and ſo figured and determined, and is endued with ſuch and ſuch properties.

Concretion is alſo the act whereby ſoft bodies are rendered hard; or an inſenſible motion of the particles of a fluid or ſoft body, whereby they come to a conſiſtence. It is indifferently uſed for induration, condenſation, congelation, and coagulation.

CONCUBINAGE ſometimes expreſſes a criminal or prohibited commerce between the two ſexes; in which ſenſe it comprehends adultery, inceſt, and ſimple fornication.

In its more reſtrained ſenſe, concubinage is uſed for a man's and a woman's cohabiting together in the way of marriage, without having paſſed the ceremony thereof.

Concubinage was anciently tolerated: the Roman law calls it an allowed cuſtom, *licita conſuetudo.* When this expreſſion occurs in the conſtitutions of the Chriſtian emperors, it ſignifies what we now call a *marriage in conſcience.*

The concubinage tolerated among the Romans in the time of the republic, and of the heathen emperors, was that between perſons not capable of contracting marriage together; nor did they even refuſe to let inheritances deſcend to children which ſprung from ſuch a tolerated cohabitance. Concubinage between ſuch perſons they looked on as a kind of marriage, and even allowed it ſeveral privileges; but then this concubinage was confined to a ſingle perſon, and was of perpetual obligation as much as marriage itſelf. Hottoman obſerves, that the Roman laws had allowed of concubinage long before Julius Cæſar made that law whereby every one was allowed to marry as many wives as he pleaſed. The emperor Valentinian, Socrates tell us, allowed every man two.

Concubinage is alſo uſed for a marriage performed with leſs ſolemnity than the formal marriage: or a marriage with a woman of inferior condition, and to whom the huſband does not convey his rank or quality. Cujas obſerves, that the ancient laws allowed a man to eſpouſe, under the title of *concubine*, certain perſons, ſuch as were eſteemed unequal to him, on account of the want of ſome qualities requiſite to ſuſtain the full honour of marriage. He adds, that though concubinage was beneath marriage, both as to dignity and civil effects; yet was concubine a reputable title, very different from that of miſtreſs among us. The commerce was eſteemed ſo lawful, that the concubine might be accuſed of adultery in the ſame manner as a wife.

This kind of concubinage is ſtill in uſe in ſome countries, particularly in Germany, under the title of a *half marriage*, *morgengabic marriage*, or *marriage with the left-hand;* alluding to the manner of its being contracted, viz. by the man's giving the woman his left hand inſtead of the right. This is a real marriage, though without ſolemnity: the parties are both bound for ever; though the woman be thus excluded from the common rights of a wife for want of quality or fortune.

The children of concubines were not reputed either legitimate or baſtards, but natural children, and were capable only of donations. They were deemed to retain the low rank of the mother; and were on this ground unqualified for inheriting the effects of the father.

Concubinage, in a legal ſenſe, is uſed as an exception againſt her that ſueth for dower, alleging thereby, that ſhe was not a wife lawfully married to the party, in whoſe lands ſhe ſeeks to be endowed, but his concubine.

CONCUBINE, a woman whom a perſon takes to cohabit with him, in the manner, and under the character, of a wife, without being authoriſed thereto by a legal marriage.

Concubine is alſo uſed for a real, legitimate, and only wife, diſtinguiſhed by no other circumſtance but a diſparity of birth or condition between her and the huſband. Du Cange obſerves, that one may gather from ſeveral paſſages in the epiſtles of the popes, that they anciently allowed of ſuch concubines. The ſeventeenth canon of the firſt council of Toledo declares, that he who, with a faithful wife, keeps a concubine, is excommunicated; but that if the concubine ſerved him as a wife, ſo that he had only one woman, under the title of concubine, he ſhould not be rejected from communion: which ſhows that there were legitimate wives under the title of concubines.

In effect, the Roman laws did not allow a man to eſpouſe whom he pleaſed; there was required a kind of parity, or proportion, between the conditions of the contracting parties: but a woman of inferior condition, who could not be eſpouſed as a wife, might be kept as a concubine; and the laws allowed of it, provided the man had no other wife.

It is certain the patriarchs had a great number of wives, and that theſe did not all hold the ſame rank; ſome being ſubaltern to the principal wife; which were what we call *concubines* or half-wives. The Romans prohibited a plurality of concubines, and only had regard to the children iſſuing from a ſingle concubine, becauſe ſhe might become a legitimate wife. Solomon had 700 wives and 300 concubines; the emperor of China has ſometimes two or three thouſand concubines in his palace. Q. Curtius obſerves, that Darius was followed in his army by 365 concubines, all in the equipage of queens.

CONCUPISCENCE, according to divines, an irregular appetite, or luſt after carnal things, inherent in the nature of man ever ſince the fall.

COND, Con, or Conn, in ſea-language, ſignifies to guide or conduct a ſhip in her right courſe. He that cons her, ſtands aloft with a compaſs before him, and gives the word of direction to the man at the helm how he is to ſteer. If the ſhip go before the wind, or, as they call it, betwixt the ſheets, the word is either Starboard, or Port the helm; according as the conder would have the helm put to the right or left ſide of the ſhip, upon which the ſhip always goes the contrary way. If he ſays, Helm a midſhip, he would have the ſhip to go right before the wind, or directly between her two ſheets. If the ſhip ſail by a wind, or on a quarter wind, the word is, Aloof, keep your luff, fall not off, veer no more, keep her to, touch the wind, have a care of the lee-latch: all which expreſſions are of the ſame import, and imply that the ſteerſman ſhould keep the ſhip near the wind. On the contrary, if he would have her ſail more large, or more before the wind, the word is, Eaſe the helm, no near, bear up. If he cries Steady, it means, keep her from going in and out, or making yaws (as they call it), howſoever ſhe ſails, whether large or before a wind: and when he would have her go juſt as ſhe does, he cries, Keep her thus, thus, &c.

CONDATE, in *Ancient Geography*, a town of Armorica in Gaul: called *Civitas Rhedonum*, in the Notitia; afterwards *Redonæ;* Redonica Regio, the diſtrict. Hence the modern name *Rennes*, in Britanny. W. Long. 1. 45. Lat. 48. 5. Another Condate of Britain (Antonine); now thought to be Congleton in Yorkſhire; others ſay in Lancaſhire.

CONDE, Lewis de Bourbon, Prince of, was born at Paris Sept. 7. 1621. He was ſtyled Duke d'Enguien, till he ſucceeded to the title of Prince of Conde by his father's death in 1646. As he was of a tender and delicate conſtitution, the prince ſent him to the caſtle of Montrond in Berry, that he might breathe a more pure and ſalutary air. Here he was educated in his infancy by ſome experienced and prudent citizens wives. When he was of a proper age, the prince took upon himſelf the taſk of governor, and appointed for his aſſiſtant M. de la Bouſſieres, a private gentleman, a man of honour, fidelity, and good nature, and who made it a rule to obſerve inviolably the orders that were given him. Two Jeſuits diſtinguiſhed for their genius and knowledge were alſo given him for preceptors. He formed him a houſehold of 15 or 20 officers, all men of the greateſt virtue and diſcretion.

With theſe attendants the duke d'Enguien went to ſettle at Bourges, where he frequented the college of Jeſuits. Here, beſides the ordinary ſtudies, he was taught ancient and modern hiſtory, mathematics, geography, declamation; alſo riding and dancing, in which laſt he ſoon excelled. He made ſuch a ſurpriſing progreſs, that before the age of 13 he defended in public ſome queſtions in philoſophy with incredible applauſe. At his return from Montrond, he had for his tutor M. de Merille; a man deeply verſed in the knowledge of common law, of ancient and modern laws, of the holy ſcriptures, and of the mathematics. Under his direction the duke went through that new courſe with prodigious ſucceſs. He acquired a critical taſte in the arts and ſciences, which he retained all his life; he never ſuffered a day to paſs without dedicating two or three hours at leaſt to reading; his thirſt for knowledge was univerſal, and he endeavoured to ſearch every thing to the bottom. His chief inclination, however, lay towards the military art; and at the age of 18 he obtained permiſſion to make his firſt campaign as a volunteer in the army commanded by M. de la Meilleraye. This campaign was unfortunate; and the duke d'Enguien was only a witneſs of the marſhal's imprudence and diſgrace. Nevertheleſs, in this campaign he laid the foundation of that renown which made him afterwards conſidered as the greateſt general of his age.

On his return to Paris, the duke waited upon Cardinal Richelieu at Ruel. That miniſter was ſo pleaſed with his converſation, that he ſoon after made propoſals of an alliance with the prince of Conde, by marrying the duke d'Enguien to Claire Clemence de Maille Breza, the cardinal's niece. The duke conſented to this match out of obedience to his father; but the force he put upon himſelf by yielding to it was ſo great, that he fell dangerouſly ill. It was long before he got the better of his diſtemper; but at length he not only recovered, but became ſo ſtrong as afterwards to bear the greateſt fatigues with eaſe.

The duke made two more campaigns as a volunteer; the one under the marſhal de la Meilleraye, the other in the army of Louis XIII. which conquered Rouſſillon. In 1643, at the age of 22, he obtained from the king, at the perſuaſion of Cardinal Mazarin, the command of the army deſtined to cover Champagne and Picardy; which command was confirmed to him after the king's death by the queen regent, Anne of Auſtria, to whoſe intereſt he was ſtrongly devoted. In this ſtation, though he never had been preſent at any battle, he ſoon gave ſuch a ſpecimen of his abilities as crowned him with glory. The Spaniards, who threatened France with an invaſion, were defeated by him at Rocroi; and this ſignal victory made him from that time conſidered as the guardian genius of his country. He next formed the project of beſieging Thionville, and propoſed it to the council of regency. They conſented with fear and diſtruſt; but the duke carried it into execution with ſuch ſkill, activity, and courage, that he became juſtly the ſubject of general admiration. In two months time Thionville ſurrendered. At length, having covered Alſace and Lorrain from the enterpriſes of the Imperialiſts, the duke returned to Paris, where he obtained the government of Champagne, and of the city of Stenai.

The three following years were little more than a ſeries of military operations. The three battles of Fribourg, in which the duke d'Enguien triumphed over Velt Marſhal Count de Mercy, the greateſt general in all Germany; the taking of Philipſbourg, and a great number of other places, which rendered him maſter of the palatinate, and of the whole courſe of the Rhine; the victory of Nortlingue, by which he revenged the viſcount du Turenne's defeat at Mariendal; the ſiege and conqueſt of Dunkirk; the good and bad ſucceſs of his arms in Catalonia, where, though he was forced to raiſe the ſiege of Lerida, he kept the Spaniards in awe, and cut to pieces their rear-guard; theſe are the principal events which diſtinguiſh the campaigns of 1644, 1645, and 1646.

The victories of the duke d'Enguien, his great reputation and eſteem with the people, began now to give umbrage to Mazarin. The cardinal's diſlike to him appeared on the death of the duke de Breze, admiral of France. The prince of Conde earneſtly demanded for his ſon the duke de Breze's places. But Mazarin, afraid of increaſing the wealth and power of a prince whom his victories and the love and confidence of the people and the army had already rendered too formidable to him, evaded his requeſt, by perſuading the queen to take the admiralty to herſelf. On the death of his father, the miniſter's diſlike to the young prince of Conde became ſtill more apparent. By the miniſter's perſuaſion he had accepted of the command of the army in Catalonia; but, on his arrival at Barcelona, he found neither troops, money, artillery, proviſions, nor ammunition. Enraged at this deception, he vented his reſentment in bitter complaints and ſevere threats; but by the reſources that he found in this dilemma, the prince added new luſtre to his glory.

The campaign of 1648 was as glorious to Conde as thoſe which preceded it had been. To diſconcert at once the projects of the archduke Leopold, the prince reſolved to attack him even in the heart of the Low Countries; and notwithſtanding the conſiderable difficulties which he had to ſurmount, he beſieged the important city of Ypres, and took it in ſight of all the enemy's forces.

Notwithſtanding this ſucceſs, Conde ſaw himſelf at the point of experiencing the greateſt reverſe of fortune. His army was a prey to ſcarcity, to nakedneſs, contagious diſtempers, and deſertion. For eight months it received no ſupply from the miniſter, but half a muſter. Every thing was ſupplied by the prince himſelf; he laviſhed his money, and borrowed more to ſupply his troops. When it was repreſented to him that he was in danger of ruining himſelf by ſuch an enormous expence, he replied, that "ſince he every day ventured his life for the ſervice of his country, he could very well ſacrifice his fortune to it. Let but the government exiſt (added he), and I ſhall want for nothing."

The French army having been reinforced by 4000 of the troops of Weimar, Conde attacked the Spaniards advantageouſly encamped near Lens, and gained a complete victory over them, which diſabled them from attempting any thing more, and even from ſupporting themſelves. Afterwards he beſieged Furnes, the garriſon of which, 500 men, ſurrendered themſelves priſoners of war. But the prince was wounded there in the trenches by a muſket-ſhot above the right hip; and the contuſion was ſo great, that he was forced to ſubmit to ſeveral inciſions.

The French court, animated with the victory at Lens, thought this a proper time to take vengeance on the factions which for ſome time had violently agitated the kingdom; and accordingly impriſoned Brouſſel and Blancmenil, two of the principal leaders of the country party. This vigorous proceeding, however, occaſioned a general revolt. Two hundred thouſand men took arms in Paris, barricaded the ſtreets, inveſted the palais-royal, and demanded the priſoners. It was neceſſary to releaſe them; but from that time the regal authority was annihilated; the queen was expoſed to a thouſand inſults, and Mazarin dared no longer venture out of the palais-royal. In this embarraſſment the queen recalled the prince of Conde, as the only one from whom ſhe could hope for ſupport. He retired to Ruel, whither the regent had gone with the young king and Mazarin. Anne of Auſtria propoſed to him the reducing of Paris by force of arms: but he calmed the reſentments of that princeſs; and inſtead of being acceſſory to her vengeance, he directed all his views to pacify the kingdom, and at length brought about an accommodation between the parties, who deſired it with equal ardour. But new incidents ſoon rekindled the combuſtion. The treachery of Mazarin, and the artifices of the leaders of the country party, occaſioned new cabals and freſh troubles. Conde was careſſed by the leaders of both parties; but at laſt, enraged at the arrogance of the malecontents, who every day formed new pretenſions, he took part openly with the court, though he thought it ungrateful, and protected the miniſter, though he did not eſteem him.

The royal family, the duke of Orleans, Conde, and Mazarin, left Paris privately in the night between the 5th and 6th of January 1646, and went to St Germains. The parliament ſent deputies to learn from the queen herſelf the reaſons of her departure, and to beg her to name the citizens whom ſhe ſuſpected, that they might be tried. Mazarin had the imprudence to diſmiſs them without any anſwer. Exaſperated at this, the people again took up arms in order to defend themſelves againſt the enterpriſes of the court, who had determined to block up and to ſtarve the capital, in order to ſuppreſs the party of malecontents. With 7000 or 8000 men, the broken relics of the laſt campaign, the prince of Conde formed a deſign of reducing above 500,000 intrenched behind walls. He had neither money nor magazines; he ſaw himſelf in the depth of a moſt ſevere winter; nevertheleſs he triumphed over Paris, and this great ſucceſs completed his glory. It did him ſo much the more honour, as during the ſiege he conſtantly defeated the troops of the malecontents; he prevailed on the army that marched to their aſſiſtance under Turenne, to abandon that general; he ſtopped the progreſs of the duke de Longueville, who had cauſed an inſurrection in Normandy; and got the ſtart of the Spaniards, who were advancing to give him battle.

Condi de Retz, coadjutor of Paris, and afterwards cardinal, was the life and ſoul of the revolters, and directed all their motions. He had taken Catiline for his model; and was equally intrepid and capable of the greateſt actions; of an exalted genius, but governed by his ambition. He diſtinguiſhed his hatred to Mazarin by arming the malecontents; and he himſelf raiſed at his own expence a regiment which he called the regiment of *Corinth*; as ſoon as this corps took the field during the blockade of Paris, it was defeated and diſperſed. This check was called *the firſt to the Corinthians*. The peace was ſigned at St Germains; but neither party carried its point, and ſcarce any one but Conde acquired glory by this war. After the concluſion of the treaty, the prince repaired to the capital, and traverſed all the ſtreets in his coach alone. All perſons of any conſequence paid their compliments to him, and the parliament ſent a ſolemn deputation to thank him for the peace to which he had ſo powerfully contributed. The people, however, made loud complaints on account of the king's abſence (for the court was not yet returned to Paris), and the malecontents gave reaſon to apprehend a new inſurrection. Conde encouraged the king and queen to return; and at length brought them to Paris, amidſt the acclamations and bleſſings of the public.

The important ſervice which Conde had juſt done the court entitled him to the acknowledgments of the queen, and eſpecially of Mazarin; but the dark ſoul of that cardinal only remembered it to puniſh a too fortunate and too powerful protector. He privately ſwore the prince's deſtruction; at leaſt that he ſhould give the whole kingdom a pattern of ſubmiſſion and dependence on his will. However, not to excite the public indignation, he ſtill kept up appearances with the prince, while he ſecretly ſpread about him diſguſts, ſuſpicions, ſnares of every kind, and the moſt heinous calumnies. The ungrateful miniſter deceived the prince by making him the moſt flattering propoſals; and with the moſt alluring promiſes, which he always found means to avoid fulfilling. The enraged prince deſpiſed the miniſter, and treated him with diſdain. After this they were reconciled again only to be again at variance. Each of them in their turn courted the country party, in order to make it ſubſervient to their deſigns. At laſt Mazarin thought of an expedient, which but too effectually anſwered his purpoſe, of making an irreconcileable quarrel between that party and the prince. Among the malecontents, the marquis de la Boulaie, a man of an infamous character, had obtained the confidence of the party by falſe appearances of hatred to the cardinal, but ſecretly kept up a correſpondence with him. It is pretended that he made him an offer of privately killing Conde. Mazarin was charmed with the propoſal; yet he only required Boulaie to exhibit all the proofs of an aſſaſſination, and to act in ſuch a manner that every thing might concur to render the country party ſuſpected of that crime. He was punctually obeyed; the coach was ſtopped; ſome piſtols were fired at it, by which two of the footmen were dangerouſly wounded; and, after that ſhameful exploit, la Boulaie took refuge in the hotel of the duke of Beaufort, who was the hero of the party, in order no doubt to countenance the prince's ſuſpicion of the malecontents. Luckily Conde was not in his coach when it was ſtopped; the cardinal had ſpread the report of his intended aſſaſſination; and in concert with the queen and the prince he had prevailed to have the coach ſent away empty, to prove the reality of the attempt. Mazarin counterfeited a zeal for the prince's life; he furiouſly declaimed againſt the malecontents, who, he pretended, had made an attempt on a life ſo precious to the ſtate; and he inflamed Conde's reſentment againſt the duke of

Beaufort and the coadjutor, whom he ſuppoſed to be the authors of this heinous outrage. The prince was ſo ſtrongly prejudiced, that he refuſed to hear them when they appeared before him to juſtify themſelves. He demanded juſtice againſt them of the king: he formally accuſed them before the parliament, and remained inflexible in ſpite of the pains which the leaders of the party took to demonſtrate to him that he had been impoſed upon. However, the affair was brought before the parliament; the accuſed defended themſelves, and the coadjutor, who had diſcovered the cardinal's ſecret, unmaſked him ſo well, that the prince agreed to a private negociation with the malecontents; he required nothing more than the coadjutor's leaving Paris, but with the rank of ambaſſador to Rome or Vienna. That prelate would have conſented to it, to ſatisfy Conde, if Mazarin, ſome days after, had not given him the choice of any recompenſe, in order to engage his concurrence in the prince's deſtruction. Affairs were now in ſuch a dangerous ſituation, that the cardinal ſaw clearly it was neceſſary to haſten to the winding up of the plot. Maſter of the queen's mind, which he guided as he pleaſed; and ſure of having inflamed againſt Conde all the reſentment of the malecontents; he ſought and obtained, by means of the ducheſs Chevreuſe, the ſupport of that powerful faction, which connected itſelf the more readily with him, in hopes that the prince's fall would ſoon enable it to cruſh without difficulty the cardinal himſelf. The coadjutor had private conferences with the queen and the miniſter. Conde had notice of it; and in order to diſcover if it were true, he endeavoured to ſurpriſe it from Mazarin's own mouth. "Cardinal (ſaid he, one day), it is publicly reported that you have nightly meetings with the coadjutor, diſguiſed like a trooper." He accompanied this ſpeech with a quick and penetrating look: but the cardinal, who was a perfect maſter of diſſimulation, anſwered him in ſuch a free, artleſs-like manner, that he entirely removed Conde's apprehenſions; and he ſlighted the information he had received, of the plot forming againſt him.

Mazarin wanted nothing but the ſupport of the duke of Orleans; and at laſt found means, by the ducheſs of Chevreuſe, to inflame the jealouſy of that fickle and inconſtant prince, and to engage him to conſent to the impriſonment of Conde. Having thus united all parties, and fearing no other obſtacle, this ungrateful and perfidious miniſter made preparations for privately arreſting the prince; the order for it was ſigned January 18. 1650. Conde having that day repaired as uſual to the palais-royal, to aſſiſt at council with the prince of Conti and the duke of Longueville, the queen gave orders to arreſt them all three, and convey them without any noiſe to the caſtle of Vincennes. She was inſtantly obeyed, and the princes were ſtrictly guarded in that priſon.

In this unexpected reverſe of fortune, the fortitude and greatneſs of Conde's mind appeared only the more remarkable. Confined with the other two princes in the tower of Vincennes, where neither ſupper, furniture, nor beds, were provided, he contented himſelf with two new laid eggs, and threw himſelf in his clothes, on a truſs of ſtraw, where he ſlept 12 hours without waking. He ſtill retained his cheerfulneſs, and dedicated the greateſt part of his time to reading; the reſt to converſation, playing at battle-door and ſhuttle-cock, to bodily exerciſes, and the cultivation of flowers.

Mazarin triumphed at the diſgrace of the princes, proſcribed all thoſe who were attached to Conde, and behaved in the moſt inſolent and arbitrary manner. The prince's friends, however, notwithſtanding their being ſtrictly watched, found means to keep up a punctual correſpondence with him. They made various attempts to releaſe him: they raiſed troops; in particular, the dukes of Bouillon and Rochefoucault, and the viſcount de Turenne. The princeſs of Conde engaged the province of Guienne to declare in his favour; ſhe made war, in order to force the court to releaſe him; at length the partizans of the prince ſigned a treaty with the Spaniards, to labour in concert for his enlargement. But all theſe efforts would, perhaps, have been ineffectual, if other more powerful reſources had not been employed.

In that gallant and warlike age, every thing was managed by the paſſions and intrigues of five or ſix women, who poſſeſſed the confidence of the leaders of the ſtate, and of the various parties. The princeſs of Mantua, wife to one of the ſons of the elector Palatine, king of Bohemia, principally directed the counſels in the party of the princes. She found means to reconcile the duke of Orleans, the coadjutor, and the malecontents, with the friends of the prince, and united their efforts againſt the cardinal. The parliament, on the other ſide, loudly demanded the releaſe of the priſoners. All the orders of the ſtate united in ſoliciting it, inſomuch that the queen was at laſt prevailed on to give her conſent. At this news, Mazarin was ſo confounded, that he fled in the diſguiſe of a trooper, and arrived at the gates of Richlieu, where a body of horſe waited for him. The parliament, informed by the queen of his flight, thundered forth an arret, by which he was obliged to leave the kingdom, with his family and foreign ſervants, in the ſpace of 15 days, under the penalty of being expoſed to a criminal proſecution. The queen deſired to follow him with the king; but the nobles and burghers inveſted the palais-royal, and prevented the execution of this project, which would have kindled a civil war. Mazarin, therefore, perceiving that it was impoſſible for the queen to join him, determined to go himſelf to reſtore the princes to their liberty, and to get the ſtart of the deputies who were coming to acquaint them with it. On his arrival at Havre, he informed the princes that they were free; he entreated Conde's friendſhip; and was ſo abject as to proſtrate himſelf at the feet of him whom he had ſo baſely oppreſſed. Conde gave him a polite reception, and ſpoke to him in a free and cheerful tone; but tired with the mean ſubmiſſions which the cardinal laviſhed upon him, he left him without making any promiſe, and ſet out on his return to Paris, which he entered as it were in triumph, amidſt the acclamations of all orders of men, and the demonſtrations of a moſt ſincere and general joy.

After this a civil war enſued, in which the prince of Conde ſided with the malecontents. Being preſſed by the king's army, he retired into the ſuburbs of St Anthony, where he behaved with the utmoſt bravery; when the citizens opened their gates and received him in; and a peace enſued ſoon after. His hatred of the cardinal, however, made him quit Paris, and take refuge among the Spaniards, who made him generaliſſimo of their forces; and he took Rocroi. The peace of the Pyrenees reſtored him to his country; and he again ſignalized himſelf at the head of the king's armies. Being afflicted with the gout, he refuſed the command of the army in 1676, and retired to Chantilly, where he was as much eſteemed for the virtues of peace, as he had been before for his military talents. He died in 1686, at Fontainbleau.

CONDE, a town of the French Netherlands, in the province of Hainault, with the title of a principality, and a caſtle. It is one of the ſtrongeſt towns in this country, and ſeated near the confluence of the rivers Haiſne and Scheldt. It was taken by the allies in 1793, and retaken by the French in 1794. Its name by the convention was changed to Nord Libre. E. Long. 3. 39. N. Lat. 50. 27.

CONDE, a town of France, in the department of Calvados, which carries on a conſiderable trade; ſeated on the river Nereau, 15 miles weſt of Paris. W. Long. 0. 37. N. Lat. 48. 50.

CONDEMNATION, the act of giving judgment, paſſing or pronouncing ſentence againſt a perſon who is thus ſubjected to ſome penalty or puniſhment, either in reſpect of life, reputation, or fortune.

CONDENSATION, the act whereby a body is rendered more denſe, compact, and heavy. The word is commonly applied to the converſion of vapour into water, by diſtillation, or naturally in the clouds. The way in which vapour commonly condenſes, is by the application of ſome cold ſubſtance. On touching it, the vapour parts with its heat which it had before abſorbed; and on doing ſo, it immediately loſes the proper characteriſtics of vapour, and becomes water. But though this is the moſt common and uſual way in which we obſerve vapour to be condenſed, nature certainly proceeds after another method: ſince we often obſerve the vapours moſt plentifully condenſed when the weather is really warmer than at other times. See the articles CLOUD, EVAPORATION, &c.

CONDENSER, a pneumatic engine, or ſyringe, with which a greater quantity of air may be crowded into a given ſpace; ſo that ſometimes ten atmoſpheres, or ten times as much air as there is at the ſame time in the ſame ſpace, under the uſual preſſure, may be thrown in by means of it, and its egreſs prevented by valves properly diſpoſed.

It conſiſts of a braſs cylinder, wherein is a moveable piſton; which being drawn out, the air ruſhes into the cylinder through a hole provided on purpoſe; and when the piſton is again forced into the cylinder, the air is driven into the receiver through an orifice, furniſhed with a valve to hinder its getting out.

The receiver or veſſel containing the condenſed air, ſhould be made very ſtrong, to bear the force of the air's ſpring thus increaſed; for which reaſon they are generally made of braſs; its orifice is fitted with a female ſcrew to receive the male ſcrew at the end of the condenſer.

If glaſs be uſed for a condenſer, it will not ſuffer ſo great a degree of condenſation; but the experiment will be more entertaining, ſince the ſubject may be viewed in the condenſed air.

CONDITION, in the civil law, a clauſe of obligation ſtipulated as an article of a treaty or a contract; or in a donation of a teſtament, legacy, &c. in which laſt caſe a donee does not loſe his donative if it be charged with any diſhoneſt or impoſſible conditions.

CONDITIONAL, ſomething not abſolute, but ſubject to conditions.

Conditional Conjunctions, in *Grammar*, are thoſe which ſerve to make propoſitions conditional; as *if*, *unleſs*, *provided*, &c.

Conditional Propoſitions, in *Logic*, ſuch as conſiſt of two parts connected together by a conditional particle.

Conditional Syllogiſm, a ſyllogiſm where the major is a conditional propoſition. Thus,

If there is a God, he ought to be worſhipped.
But there is a God;
Therefore he ought to be worſhipped.

CONDIVICNUM, in *Ancient Geography*, the capital of the Namnetes, in Armorica. Now Nantes in Brittany, on the Loire, from its name *Civitas Namnetum*. W. Long. 1. 30. Lat. 47. 15.

CONDOM, a town of Gaſcony in France, capital of the Condomois, with a biſhop's ſee. It is but a poor place, and the trade is very ſmall. It is ſeated on the river Geliſſe, in E. Long. 0. 22. N. Lat. 44.

CONDOR, or CONTOR. See VULTURE, ORNITHOLOGY *Index*.

CONDORCET, JOHN-ANTONY NICHOLAS CARITAT, marquis of, a French writer, and political character of conſiderable eminence, deſcended from an ancient family from the principality of Orange, and born at Ribemont in Picardy, in 1743. He received his education at the college of Navarre, where he was diſtinguiſhed at an early period of life for his ſtrong attachment to the ſtudy of phyſics and mathematics. On his entrance into public life, he eſtabliſhed a friendly intercourſe with Voltaire, D'Alembert, and other literary characters, who profeſſed opinions analogous to his own, and formed a very powerful party among the French literati, whoſe united efforts to propagate their ideas of religion and politics, have been applauded or condemned, according to the principles of their different judges. Condorcet firſt attracted the attention of the public as a mathematician, obtaining their approbation for his treatiſe on integral calculations, which he compoſed at the age of 22. In the year 1767, his ſolution of the problem of the Three Bodies made its appearance, and in the following year the firſt part of his "Eſſay on Analyſis." In the year 1769 he was received a member of the Academy of Sciences, the memoirs of which were greatly enriched by him with different papers on the moſt abſtruſe branches of mathematical ſcience. His juſtly merited reputation pointed him out as a fit perſon to cooperate with D'Alembert and Boſſut, in aſſiſting M. Turgot, that celebrated miniſter and able financier, with arithmetical calculations. In the mean time he laboured indefatigably in the ſtudy of politics and metaphyſics, and defended, in an anonymous publication, the ſect of philoſophers to which he had attached himſelf, from an

Condorcet.

an attack made upon them in the Trois Siecles; and replied to M. Necker's eſſay on Corn Laws. He was appointed ſecretary to the Academy of Sciences in the year 1773, when he employed much of his time in writing eulogies on ſuch of its deceaſed members as Fontenelle had paſſed over in ſilence. Like D'Alembert and ſome others, Condorcet having united in himſelf the characters of an elegant writer and a man of profound reſearch, was admitted into the French academy in 1703, when he pronounced an oration on the influence of philoſophy, which was ordered to be printed. From the time of D'Alembert's death, which happened this year, he filled the ſtation of ſecretary to that academy, rendering his name conſpicuous by the publication of eulogies on different eminent characters. His panegyric on D'Alembert, to whom he was moſt ſincerely attached, is a very elaborate performance, notwithſtanding of which it is eſteemed by judges as a candid account of the genuine merits of that great philoſopher. His encomium beſtowed on that very able mathematician Euler, furniſhed him with a favourable opportunity of giving a circumſtantial account of the ſpecific improvements and inventions conferred on a peculiar branch of ſcience by the labours of an individual; a talent in a biographical writer which Condorcet appears to have poſſeſſed in an eminent degree. His eulogy on the miniſter Turgot was read with avidity, and admired by all thoſe who approved of Turgot's plans of government and ſyſtem of finance. In the year 1787 he gave the public his "Life of Voltaire," which was highly elaborate, and replete with lofty panegyric, on the merits of which mankind were conſequently much divided, according to their ſentiments of that author's philoſophy. The laſt of his biographical works was an eulogy on the celebrated Dr Franklin, publiſhed in 1790, all of which will be read with ſome degree of prejudice by thoſe who are inimical to the ſchool of philoſophy to which he belonged.

The memorable event of the French revolution, which the writings of Condorcet and his aſſociates unqueſtionably accelerated, naturally intereſted his feelings, and called forth his exertions. But the conduct of the political parties and their leaders, during this tumultuous period, is painted in colours ſo diametrically oppoſite to each other, that a proper eſtimate of it is ſcarcely poſſible. In this part of Condorcet's life, therefore, we muſt confine ourſelves to ſuch facts as are univerſally acknowledged, leaving it to our readers to draw inferences for themſelves.

At an early period he employed his talents to promote thoſe reforms, (for ſuch they appeared in his judgment) which were to pave the way to a new order of things. A work entitled *La Bibliotheque de l'Homme Public*, to contain an analyſis of the writings of the moſt eminent politicians, was chiefly conducted by him, as was alſo a newſpaper called *La Chronique de Paris*, filled with declamation againſt royalty. He had likewiſe a ſhare in the *Journal de Paris*, a paper conducted on ſimilar principles. About the time when the unfortunate king fled to Varennes he propoſed a paper called *Le Republicain*, the obvious intention of which is clearly deducible from its title. He was an indefatigable member of the Jacobin club, and ſpoke frequently, though not forcibly, in it. He was choſen a repreſentative for Paris when the conſtituent aſſembly was diſſolved, and followed the general political courſe of the Briſſotine party. A plan for public inſtruction was now to exerciſe his abilities, which he finiſhed in two elaborate memoirs, allowed to contain ſome exalted and enlarged ideas, but perhaps rather extenſive to be reduced to practice. He was likewiſe author of the manifeſto addreſſed to the European powers by the people of France, on the approach of a war. He wrote a letter of expoſtulation to the king while he was preſident of the aſſembly, which ſome have conſidered as by far too ſevere, and deſtitute of that ceremony to which the ſovereign was entitled. When the king was inſulted by the populace at the Thuilleries, in being offered the red cap, it is ſaid that he vindicated their proceedings. We are alſo informed, that while he was degrading royalty in this manner, he was ſecretly ſoliciting the office of tutor to the dauphin; a propoſition which the king utterly rejected, on account of his avowed infidelity. Attempts have been made to fix upon his character the moſt abominable ingratitude, by making him acceſſory to the murder of the duke de la Rochefoucault, to whom he was under the ſtrongeſt obligations, and from whoſe family he had received a moſt accompliſhed wife with a fortune; but we ſincerely hope that this calumny entirely originated from the malevolence of party ſpirit. When the trial of the king came to be agitated, Condorcet gave it as his opinion that he could not be brought to judgment in a legal manner; yet it muſt be confeſſed that his conduct in regard to the ſentence, was rather of an ambiguous nature, and betrayed that timidity and want of reſolution which formed the moſt prominent features of his political career. The judgment of Madame Roland concerning the moral conſtitution of this wonderful man has all the air of impartiality. "The genius of Condorcet," ſays that lady, "is equal to the comprehenſion of the greateſt truths; but he has no other characteriſtic beſides fear. It may be ſaid of his underſtanding, combined with his perſon, that it is a fine eſſence abſorbed in cotton. The timidity which forms the baſis of his character, and which he diſplays even in company, does not reſult from his frame alone, but ſeems to be inherent in his ſoul, and his talents furniſh him with no means of ſubduing it. Thus, after having deduced a principle or demonſtrated a fact in the aſſembly, he would give a vote decidedly oppoſite, overawed by the thunder of the tribunes, armed with inſults, and laviſh of menaces. The propereſt place for him was the ſecretaryſhip of the academy. Such men ſhould be employed to write, but never permitted to act." The Gironde party, after the execution of the king, employed him to frame a new conſtitution, the plan of which was preſented to the convention, and obtained their approbation. It was not thus eſteemed by the people at large; and it has, perhaps not without reaſon, been conſidered as "a maſs of metaphyſical abſurdities." During the violent ſtruggle between the Gironde and Mountain parties, Condorcet took no decided part with either, which ſeems to have been owing to the native timidity of his mind, and his abhorrence of the ſtate of public affairs. He was not comprehended among the number of thoſe who were ſacrificed with their leader Briſſot; but having employed his pen againſt the victorious party, ty, he fell under the invincible diſpleaſure of that inhuman, blood-thirſty tyrant, Robeſpierre, who iſſued a decree of accuſation againſt him in July, 1793. He found means to effect his eſcape from the arreſt, and during nine months concealed himſelf in Paris. Dreading at length that the tyrant would order a domiciliary viſit for the purpoſe of diſcovering the place of his retreat, he paſſed through the barriers without being taken notice of, and went to the houſe of a perſon in whom he could confide, on the plain of Mont-Rouge, who unfortunately for Condorcet was at that time in the metropolis. He was of conſequence under the neceſſity of paſſing two dreary nights in the open fields, a melancholy prey to hunger and cold. On the third day he obtained an interview with his friend, who unhappily durſt not venture to afford him ſhelter under his roof, ſo that he was once more compelled to wander in the fields. Worn out at length by hunger and fatigue, and life being no longer ſupportable without ſuſtenance, he applied at a public houſe for an omelette, which he devoured with greedineſs. His cadaverous appearance and uncommonly keen appetite, rouſed the ſuſpicion of a municipal officer who happened to be preſent, and by whom he was interrogated. The ambiguity and heſitation which characterized his anſwers, made the officer conclude that it would be proper to apprehend him. He was accordingly conſigned to a dungeon, to be next day conducted to Paris, but his melancholy fate rendered ſuch a meaſure unneceſſary. He was found dead in the morning; and as it was generally underſtood that he conſtantly carried with him a doſe of poiſon, to this cauſe his melancholy exit was very properly aſcribed. Thus terminated the career of Condorcet on the 28th of March, 1794, who for many years ſuſtained a brilliant and honourable reputation in the republic of letters. His manners were replete with urbanity, and as well qualified to pleaſe in company as could be expected in a man who was conceived as deſtitute of a heart. He was certainly bleſſed with domeſtic felicity, and had one daughter by his wife. Soon after his death appeared his "Sketch of a Hiſtorical Draught of the Progreſs of the Human mind," a methodical performance, and evincing the profoundeſt reſearch, in which he ſtrongly recommends his favourite idea of gradually bringing human nature to a ſtate of perfection, by conſidering what man has been, now is, and may be. This treatiſe will no doubt be viewed by ſome as rather fanciful, but it is clearly the effort of a very ſuperior genius, and muſt be peculiarly intereſting to the feeling man, when it is known that it was compoſed while its author was in circumſtances of danger and diſtreſs. The idea of man's progreſſive advancement towards perfection and happineſs, inſpired him with conſolation under his complicated misfortunes. Beſides the works which we have enumerated in this ſketch of his life, he publiſhed "Letters to the King of Pruſſia," with whom he kept up a correſpondence, as well as with Catharine empreſs of Ruſſia. A treatiſe on calculation, and an elementary treatiſe on arithmetic, were left behind him in manuſcript. Although he was an enemy to revealed religion, he was certainly a man of virtue and integrity; yet all his philoſophy could never inſpire him with that heroic fortitude and contempt of death in a juſt cauſe, for which the ſincere votaries of Chriſtianity have ever been ſo conſpicuous.

CONDORMIENTES, in church hiſtory, religious ſectaries, who take their name from lying all together, men and women, young and old. They aroſe in the 13th century, near Cologne; where they are ſaid to have worſhipped an image of Lucifer, and to have received anſwers and oracles from him.

CONDRIEU, a town of Lyonnois in France, remarkable for its excellent wines. It is ſeated at the foot of a hill near the river Rhone. E. Long. 4. 33. N. Lat. 45. 28.

CONDRUSII, in *Ancient Geography*, a people of Belgica, originally Germans, dwelling about the Maeſe. Their country is now called *Condrotz*, in in the biſhopric of Liege, between Luxemburgh and the Maeſe.

CONDUCTOR, in *Surgery*, an inſtrument which ſerves to conduct the knife in the operation of cutting for the ſtone, and in laying up ſinuſes and fiſtulas.

CONDUCTORS, in electrical experiments, as thoſe bodies that receive and communicate electricity; and thoſe that repel it are called *non-conductors*. See ELECTRICITY.

CONDUIT, a canal or pipe for the conveyance of water, or other fluid.

There are ſeveral ſubterraneous conduits through which the waters paſs that form ſprings. Artificial conduits for water are made of lead, ſtone, caſt-iron, potter's earth, timber, &c.

CONDYLOID and CORONOID proceſſes. See ANATOMY *Index*.

CONDYLOMA, in *Medicine*, a tubercle, or callous eminence, which ariſes in the folds of the anus; or rather a ſwelling or hardening of the wrinkles of that part.

CONDYLUS, a name given by anatomiſts to a knot in any of the joints, formed by the epiphyſis of a bone.

CONE, in *Geometry*, a ſolid figure, having a circle for its baſe, and its top terminated in a point or vertex. See CONIC SECTIONS.

Melting CONE, in *Chemiſtry*, is a hollow cone formed of copper or braſs, with a handle, and with a flat bottom adjoining to the apex of the cone, upon which it is intended to reſt. Its uſe is to receive a maſs of one or more metals melted together, and caſt into it. This maſs, when cold, may be eaſily ſhaken out of the veſſel, from its figure. Alſo, if a melted maſs conſiſting of two or more metals, or other ſubſtances not combined together, be poured into this veſſel, the conical figure facilitates the ſeparation of theſe ſubſtances according to their reſpective denſities. The cone ought to be well heated before the melted maſs is thrown into it; that it may not contain any moiſture, which would occaſion a dangerous exploſion. It ought alſo to be greaſed internally with tallow, to prevent the adheſion of the fluid matter.

CONE *of Rays*, in *Optics*, includes all the ſeveral rays which fall from any radiant point upon the ſurface of a glaſs.

CONE. See CONUS, BOTANY *Index*.

CONE-*Shell*. See CONUS, CONCHOLOGY *Index*.

CONESSI, a ſort of bark of a tree, which grows on the Coromandel coaſt in the Eaſt Indies. It is recommended in a letter to Dr Monro, in the Medical Eſſays, as a ſpecific in diarrhœas. It is to be finely pulverized, and made into an electuary with ſyrup of oranges. The bark ſhould be freſh, and the electuary new made every day, or ſecond day, otherwiſe it loſes its auſtere but grateful bitterneſs on the palate, and its proper effects on the inteſtines.

CONFARREATION, a ceremony among the ancient Romans, uſed in the marriage of perſons whoſe children were deſtined for the honour of the prieſthood.

Confarreation was the moſt ſacred of the three modes of contracting marriage among that people; and conſiſted, according to Servius, in this, that the *pontifex maximus* and *flamen dialis* joined and contracted the man and woman, by making them eat of the ſame cake of ſalted bread; whence the term *far*, ſignifying *meal* or *flour*.

Ulpian ſays, it conſiſted in the offering up of ſome pure wheaten bread; rehearſing, withal, a certain formula, in preſence of ten witneſſes. Dionyſius Halicarnaſſeus adds, that the huſband and wife did eat of the ſame wheaten bread, and threw part on the victims.

CONFECTION, in *Pharmacy*, ſignifies, in general, any thing prepared with ſugar; in particular it imports ſomething preſerved, eſpecially dry ſubſtances. It alſo ſignifies a liquid or ſoft electuary, of which there are various ſorts directed in diſpenſatories. See PHARMACY.

CONFECTOR, among the ancient Romans, a ſort of gladiator, hired to fight in the amphitheatre againſt beaſts; thence alſo denominated *beſtiarius*.

The *confectores* were thus called *à conficiendis beſtiis*, from their deſpatching and killing beaſts.

The Greeks called them παραβολοι, q. d. *daring*, *raſh*, *deſperate;* whence the Latins borrowed the appellations *parabolani* and *parabolarii*. The Chriſtians were ſometimes condemned to this ſort of combat.

CONFECTS, a denomination given to fruits, flowers, herbs, roots, &c. when boiled or prepared with ſugar or honey, to diſpoſe them to keep, and render them more agreeable to the taſte.

CONFEDERACY, in *Law*, is when two or more perſons combine to do any damage to another, or to commit any unlawful act. Confederacy is puniſhable, though nothing be put in execution: but then it muſt have theſe four incidents; 1. That it be declared by ſome matter of proſecution, as by making of bonds or promiſes to one another; 2. That it be malicious, as for unjuſt revenge; 3. That it be falſe, i. e. againſt the innocent; and, laſtly, That it be out of court voluntary.

CONFERVA. See BOTANY *Index*.

CONFESSION, in a civil ſenſe, a declaration or acknowledgment of ſome truth, though againſt the intereſt of the party who makes it; whether it be in a court of juſtice or out of it. It is a maxim, that in civil matters, the confeſſion is never to be divided, but always taken entire. A criminal is never condemned on his ſimple confeſſion, without other collateral proofs; nor is a voluntary extrajudicial confeſſion admitted as any proof. A perſon is not admitted to accuſe himſelf, according to that rule in law, *Non auditur perire volens*. See ARRAIGNMENT.

CONFESSION, among divines, the verbal acknowledgment which a Chriſtian makes of his ſins.

Among the Jews it was the cuſtom, on the annual feaſt of expiation, for the high-prieſt to make confeſſion of ſins to God in the name of the whole people: beſides this general confeſſion, the Jews were enjoined, if their ſins were a breach of the firſt table of the law, to make confeſſion of them to God; but violations of the ſecond table were to be acknowledged to their brethren. The confeſſions of the primitive Chriſtians were all voluntary, and not impoſed on them by any laws of the church; yet private confeſſion was not only allowed, but encouraged.

The Romiſh church requires confeſſion not only as a duty, but has advanced it to the dignity of a ſacrament: this confeſſion is made to the prieſt, and is private and auricular; and the prieſt is not to reveal them under pain of the higheſt puniſhment.

CONFESSION *of Faith*, a liſt of the ſeveral articles of belief in any church.

CONFESSIONAL, or CONFESSIONARY, a place in churches under the great altar, where the bodies of deceaſed ſaints, martyrs, and confeſſors, were depoſited.

This word is alſo uſed by the Romaniſts for a deſk in the church where the confeſſor takes the confeſſions of the penitents.

CONFESSOR, a Chriſtian who has made a ſolemn and reſolute profeſſion of the faith, and has endured torments in its defence. A mere ſaint is called a confeſſor, to diſtinguiſh him from the roll of dignified ſaints; ſuch as apoſtles, martyrs, &c. In eccleſiaſtical hiſtory, we frequently find the word confeſſors uſed for martyrs: in after-times, it was confined to thoſe who, after having been tormented by the tyrants, were permitted to live and die in peace. And at laſt it was alſo uſed for thoſe who, after having lived a good life, died under an opinion of ſanctity. According to St Cyprian, he who preſented himſelf to torture, or even to martyrdom, without being called to it, was not called a *confeſſor* but a *profeſſor:* and if any out of a want of courage abandoned his country, and became a voluntary exile for the ſake of the faith, he was called *exterris*.

CONFESSOR is alſo a prieſt, in the Romiſh church, who has a power to hear ſinners in the ſacrament of penance, and to give them abſolution. The church calls him in Latin *confeſſarius*, to diſtinguiſh him from confeſſor, which is a name conſecrated to ſaints. The confeſſors of the kings of France, from the time of Henry IV. have been conſtantly Jeſuits: before him the Dominicans and Cordeliers ſhared the office between them. The confeſſors of the houſe of Auſtria have alſo, ordinarily, been Dominicans and Cordeliers; but the later emperors have all taken Jeſuits.

CONFIGURATION, the outward figure which bounds bodies, and gives them their external appearance; being that which, in a great meaſure, conſtitutes the ſpecific difference between bodies.

CONFIRMATION, in a general ſenſe, the act of ratifying or rendering a title, claim, report, or the like, more ſure and indiſputable.

CONFIRMATION, in *Law*, a conveyance of an eſtate, or right in *eſſe*, from one man to another, whereby a voidable eſtate is made ſure and unavoidable, or a particular eſtate is increaſed, or a poſſeſſion made perfect.

Confirmation, in *Theology*, the ceremony of laying on of hands, for the conveyance of the Holy Ghoſt.

The antiquity of this ceremony is, by all ancient writers, carried as high as the apoſtles, and founded upon their example and practice. In the primitive church, it uſed to be given the Chriſtians immediately after baptiſm, if the biſhop happened to be preſent at the ſolemnity. Among the Greeks, and throughout the Eaſt, it ſtill accompanies baptiſm; but the Romaniſts make it a diſtinct independent ſacrament. Seven years is the ſtated time for confirmation; however, they are ſometimes confirmed before, and ſometimes after, that age. The perſon to be confirmed has a godfather and godmother appointed him, as in baptiſm. The order of confirmation in the church of England does not determine the preciſe age of the perſons to be confirmed.

CONFISCATION, in *Law*, the adjudication of goods or effects to the public treaſury; as the bodies and effects of criminals, traitors, &c.

CONFLAGRATION, the general burning of a city or other conſiderable place.

This word is commonly applied to that grand period or cataſtrophe of our world, when the face of nature is to be changed by fire, as formerly it was by water. The ancient Pythagoreans, Platoniſts, Epicureans, and Stoics, appear to have had a notion of the conflagration; though whence they ſhould derive it, unleſs from the ſacred books, is difficult to conceive; except, perhaps, from the Phœnicians, who themſelves had it from the Jews. Seneca ſays expreſsly, *Tempus advenerit quo ſidera ſideribus incurrent, et omni flagrante materia uno igne, quicquid nunc ex depoſito lucet, ardebit.* This general diſſolution the Stoics call *εκπυρωσις*, *ecpyroſis*. Mention of the conflagration is alſo made in the books of the Sibyls, Sophocles, Hyſtaſpes, Ovid, Lucan, &c. Dr Burnet, after F. Tachard and others, relates that the Siameſe believe that the earth will at laſt be parched up with heat; the mountains melted down; the earth's whole ſurface reduced to a level, and then conſumed with fire. And the Bramins of Siam do not only hold that the world ſhall be deſtroyed by fire, but alſo that a new earth ſhall be made out of the cinders of the old:

Various are the ſentiments of authors on the ſubject of the conflagration; the cauſe whence it is to ariſe, and the effects it is to produce. Divines ordinarily account for it metaphyſically; and will have it take its riſe from a miracle, as a fire from heaven. Philoſophers contend for its being produced from natural cauſes; and will have it effected according to the laws of mechanics. Some think an eruption of the central fire ſufficient for the purpoſe, and add, that this may be occaſioned ſeveral ways, viz. either by having its intenſity increaſed; which again may be effected either by being driven into leſs ſpace by the encroachments of the ſuperficial cold, or by an increaſe of the inflammability of the fuel whereon it is fed; or by having the reſiſtance of the impriſoning earth weakened, which may happen either from the diminution of its matter, by the conſumption of its central parts, or by weakening the coheſion of the conſtituent part of the maſs by the exceſs or the defect of moiſture. Others look for the cauſe of the conflagration in the atmoſphere, and ſuppoſe, that ſome of the meteors there engendered in unuſual quantities, and exploded with unuſual vehemence, from the concurrence of various circumſtances, may effect it, without ſeeking any further. The aſtrologers account for it from a conjunction of all the planets in the ſign Cancer; as the deluge, ſay they, was occaſioned by their conjunction in Capricorn. Laſtly, others have recourſe to a ſtill more effectual and flaming machine, and conclude the world is to undergo its conflagration from the near approach of a comet in its return from the ſun.

CONFLUENT, among phyſicians, &c. an appellation given to that kind of Small-pox wherein the puſtules run into each other.

CONFLUENTES, in *Ancient Geography*, a place at the confluence of the Rhine and Moſelle, ſuppoſed to be one of the 50 forts erected by Druſus on the Rhine, in Gallia Belgica: Now *Coblentz*, a town of Triers. E. Long. 7. 15. N. Lat. 50. 30.

CONFORMATION, the particular conſiſtence and texture of the parts of any body, and their diſpoſition to compoſe a whole.

Conformation, in *Medicine*, that make and conſtruction of the human body which is peculiar to every individual. Hence a *mala conformatio* ſignifies ſome fault in the firſt rudiments; whereby a perſon comes into the world crooked, or with ſome of the viſcera or cavities unduly framed or proportioned. Many are ſubject to incurable aſthmas, from a too ſmall capacity of the thorax, and the like vicious conformations.

CONFORMITY, in the ſchools, is the congruency or relation of agreement between one thing and another; as between the meaſure and the thing meaſured, the object and the underſtanding, the thing and the diviſion thereof, &c.

CONFRONTATION, the act of bringing two perſons in preſence of each other, to diſcover the truth of ſome fact which they relate differently.

The word is chiefly uſed in criminal matters, where the witneſſes are confronted with the accuſed, the accuſed with one another, or the witneſſes with one another.

CONFUCIUS, or Cong-fu-tse, the moſt eminent, and moſt juſtly venerated of all the philoſophers of China, a deſcendant of the imperial family of the dynaſty of Chang, was born in the kingdom of Lu, now called the province of Chang-tong, about 550 years before the commencement of the Chriſtian æra. This makes him to have been cotemporary with Pythagoras and Solon, and prior to the days of Socrates. He gave ſtriking proofs of very uncommon talents at an early period of life, which were cultivated and improved with great aſſiduity under the tuition of the ableſt maſters. Scarcely had he attained to the years of maturity, when he evinced himſelf acquainted with all the literature of that period, poſſeſſing, in particular, a comprehenſive knowledge of the canonical and claſſical books, aſcribed to the legiſlators Yao and Chun, which the Chineſe emphatically denominate *the five volumes*, as containing the eſſence of all their ſcience and morality. Nature had beſtowed upon him a moſt amiable temper, and his moral deportment was altogether unexceptionable. He acquired a diſtinguiſhed reputation for humility, ſincerity, the government of his appetites, a diſintereſted heart, and a ſovereign contempt of wealth. Theſe rare qualities pointed him out as a proper perſon to fill offices of importance and truſt in the government of his country, which he did with honour to himſelf and advantage to the empire. Theſe public ſtations afforded him excellent opportunities of eſtimating with accuracy the true ſtate of morals among his countrymen, which at this time were diſſolute and vicious in the extreme. He conceived the godlike idea of attempting a general reformation both in morals and in politics, and his efforts for ſome time were attended with ſuch remarkable effects, that he inſpired his countrymen with a juſt veneration for his excellent character, and gratitude for his exertions, being raiſed to a ſtation of the laſt importance in the kingdom of Lu. Here his counſels and advice were productive of the moſt beneficial conſequences, in eſtabliſhing good order, the due exerciſe of juſtice, concord, and decorum through the whole kingdom. As it thus very naturally became an object of admiration, ſo, likewiſe, neighbouring princes beheld with envy its growing happineſs and proſperity; to deſtroy which, they contrived a fatal and effectual expedient. The king of Tſi being apprehenſive, that if the king of Lu continued to be directed by the wiſdom and ſound policy of Confucius, he would ſoon become by far too powerful, ſent him and his nobility a preſent of the moſt beautiful young women, trained up from their infancy in all the arts of ſeduction, who were but too ſucceſsful in plunging the whole court into voluptuouſneſs and diſſipation. This demoliſhed in a ſhort time, the whole of that beautiful fabric which had been erected by Confucius. Finding it a hopeleſs attempt to ſtem the univerſal torrent of corruption and depravity, he reſolved to exert his talents in ſome diſtant kingdom, in the philanthropic cauſe of moral reformation, in hopes of better ſucceſs. But he had the mortification to diſcover, that vice was everywhere triumphant, while virtue, that darling of his ſoul, was compelled to hide her head. This induced him to adopt the more humble, although not the leſs intereſting employment, of a teacher of youth, in which he made great and rapid progreſs. About 600 of his ſcholars were ſent into different parts of the empire, to carry on his favourite work of moral reformation. Among his diſciples, 72 were remarkably diſtinguiſhed above the reſt for their mental acquiſitions, and 10 others were deemed ſuperior, even to theſe, as having a thorough comprehenſion of their maſter's whole ſyſtem. Theſe were divided by him into four claſſes; the firſt being deſtined to the ſtudy of the moral virtues; the ſecond to the arts of logic and public ſpeaking; the third claſs ſtudied juriſprudence and the duties of the civil magiſtrate; and public ſpeaking, or the delivery of popular diſcourſes on moral topics. Indefatigable, however, as his labours were, the taſk was too mighty to be accompliſhed by human exertions. During his laſt illneſs, he declared to his pupils, that the grief of his mind occaſioned by the profligacy of human nature was become inſupportable; and with a melancholy voice, he exclaimed "Immenſe mountain, how art thou fallen! The grand machine is demoliſhed, and the wiſe and the virtuous are no more. The kings will not follow my maxims; I am no longer uſeful on earth; it is, therefore, time that I ſhould quit it." On uttering theſe words he was ſeized with a lethargy, which brought him to the grave. He finiſhed his honourable career in the 72d year of his age, in his native kingdom, to which he had returned in company with his diſciples. It is frequently the fate of illuſtrious characters, never to be properly valued till they are cut off by death; which was the caſe with Confucius. The whole empire of China bewailed the loſs of him, and erected innumerable edifices to perpetuate his memory, adorned with ſuch honourable inſcriptions as the following: "To the great maſter;" "To the chief doctor;" "To the ſaint;" "To the wiſe king of literature;" "To the inſtructor of emperors and kings." All his deſcendants, even to the preſent day, enjoy the honourable title and office of mandarins, and are exempted from the payment of taxes to the emperor, as well as the princes of the blood. The man who applies for the title of doctor, muſt previouſly have made a preſent to a mandarin deſcended in a direct line from Confucius. The writings of this great man are eſteemed by the Chineſe as of the higheſt authority, next to the five volumes, to which he modeſtly acknowledges himſelf to have been much indebted. His works are, 1. The *Tay-hio*; "The Grand Science, or School of Adults," chiefly intended for the information of princes and magiſtrates, recommending the duties of ſelf-government, and uniform obedience to the laws of right reaſon. 2. The *Chong-yong*, or "Immutable Medium," in which he ſhews its importance in the government of the paſſions by a variety of examples, and points out the method of arriving at perfection in virtue. 3. *Lung-yu*, or moral and ſententious diſcourſes, which exhibit a lively picture of the opinions, conduct, and maxims of Confucius and his followers. 4. *Meng-tſe*, the book of Mencius, which derived its name from one of that great philoſopher's diſciples. Theſe are all deſervedly eſteemed by the Chineſe, being held next in importance to the five volumes. 5. The *Hyau-king*, or diſſertation on the duty and reſpect which children owe their parents; and, 6. The *Syan-hyo*, or ſcience for children, being a judicious collection of moral ſentences from ancient and modern writers.

If a fair and impartial eſtimate of the religion of Confucius be made, it cannot be viewed in any other light than as uncorrupted deiſm, although he has ſometimes been accuſed of befriending and ſecretly propagating atheiſtical ſentiments; but ſuch an accuſation is as cruel as it is unjuſt, ſince the purity of his moral precepts, and the acknowledged rectitude of his whole deportment, are utterly incompatible with ſuch a ſuppoſition. He conſidered the Tyen or Deity as the pureſt and moſt perfect eſſence, principle, and ſource of all things in the boundleſs univerſe, who is abſolutely independent, omnipotent, the governor and guardian of every thing; poſſeſſed of infinite wiſdom which nothing can deceive; holy, without partiality, of unlimited goodneſs and juſtice. We are at a loſs to form any adequate opinion of his ſentiments relative to the ſoul of man and the doctrine of futurity, having no well authenticated data, on which to proceed. His morality is in many inſtances ſuperior to that of Greece and Rome, and yields to none upon earth, except to that of divine revelation. The religion of Confucius, notwithſtanding the eſtimation in which he is held, is adopted as a model by none of his countrymen, the literati excepted. Their prevailing ſyſtem is a medley of pagan idolatry and the fabulous ſuperſtition of the Indians, introduced into China by Fo, in the firſt century of the Chriſtian era.

CONFUSION, in a general ſenſe, is oppoſed to *order*, in a perturbation whereof confuſion conſiſts: *e. gr.* when things prior in nature do not precede, or poſterior do not follow, &c.

In a logical ſenſe, confuſion is oppoſed to diſtinctneſs or perſpicuity: and may happen either in words, as when miſcontrived or miſapplied; or in ideas, as when the idea of any thing preſents ſomething along with it, which does not properly belong to that thing. See IDEA and NOTION.

In a phyſical ſenſe, confeſſion is a ſort of union or mixture by mere contiguity. Such is that between fluids of contrary nature, as oil and vinegar, &c.

CONFUSION, in *Scots Law*, is a method of ſuſpending and extinguiſhing obligations. For the illuſtration of this, ſee LAW *Index*.

CONFUSION of Tongues, in the hiſtory of mankind, is a memorable event, which happened in the one hundred and firſt year according to the Hebrew chronology, and the four hundred and firſt year by the Samaritan, after the flood, at the overthrow of Babel; and which was providentially brought about in order to facilitate the diſperſion of mankind and the population of the earth. Until this period there had been one common language, which formed a bond of union that prevented the ſeparation of mankind into diſtinct nations; and ſome have ſuppoſed, that the tower of Babel was erected as a kind of fortreſs, by which the people intended to defend themſelves againſt that ſeparation which Noah had projected.

There has been a conſiderable difference of opinion as to the nature of this confuſion, and the manner in which it was effected. Some learned men, prepoſſeſſed with the notion that all the different idioms now in the world did at firſt ariſe from one original language to which they may be reduced, and that the variety among them is no more than muſt naturally have happened in a long courſe of time by the mere ſeparation of the builders of Babel, have maintained, that there were no new languages formed at the confuſion; but, that this event was accompliſhed by creating a miſunderſtanding and variance among the builders, without any immediate influence on their language. But this opinion, advanced by Le Clerc, &c. ſeems to be directly contrary to the obvious meaning of the word שפה, *ſhapha*, "lip," uſed by the ſacred hiſtorian.—Others have imagined, that this was brought about by a temporary confuſion of their ſpeech, or rather of their apprehenſions, cauſing them, whilſt they continued together and ſpoke the ſame language, to underſtand the words differently. Scaliger is of this opinion. Others, again, account for this event by the privation of all language, and by ſuppoſing that mankind were under a neceſſity of aſſociating together, and of impoſing new names on things by common conſent. Another opinion aſcribes the confuſion to ſuch an indiſtinct remembrance of the original language which they ſpoke before, as made them ſpeak it very differently; ſo that by the various inflexions, terminations, and pronunciations of divers dialects, they could no more underſtand one another, than they who underſtand Latin can underſtand thoſe who ſpeak French, Italian, or Spaniſh, though all theſe languages ariſe out of it. This opinion is adopted by Caſaubon, and by Biſhop Patrick in his Commentary *in loc.* and is certainly much more probable than either of the former. And Mr Shuckford maintains, that the confuſion aroſe from ſmall beginnings, by the invention of new words in either of the three families of Shem, Ham, and Japhet, which might contribute to ſeparate them from one another: and that in each family new differences of ſpeech might gradually ariſe, ſo that each of theſe families went on to divide and ſubdivide among themſelves. Others, again, as Mr Joſ. Mede and Dr Wotton, &c. not ſatisfied with either of the foregoing methods of accounting for the diverſity of languages among mankind, have recourſe to an extraordinary interpoſition of divine power, by which new languages were framed and communicated to different families by a ſupernatural infuſion or inſpiration; which languages have been the roots and originals from which the ſeveral dialects that are, or have been, or will be ſpoken, as long as this earth ſhall laſt, have ariſen, and to which they may with eaſe be reduced. As to the number of languages thus introduced, many opinions have been adopted. If there were no more than there were nations or heads of nations, then the number would be ſeven for Japhet, four for Ham, and five for Shem; but if there were as many as there were families, which is the more probable opinion, their number cannot be certainly aſſigned. However, the Hebrews fancy they were 70, becauſe the deſcendants from the ſons of Noah, enumerated Geneſis x. were juſt ſo many. Allowing, then, the languages of the chief families to have been fundamentally different from each other, the ſub-languages and dialects within each branch would probably have had a mutual affinity, greater or leſs as they ſettled nearer or farther from each other. But whichſoever of theſe hypotheſes is adopted, the primary object of the confuſion at Babel was the ſeparation and diſperſion of mankind.

Dr Bryant, in the third volume of his Analyſis of Ancient Mythology, has advanced a ſingular hypotheſis, both with reſpect to the confuſion of tongues and the diſperſion. He ſuppoſes that the confuſion of language was local and partial, and limited to Babel only. By בלהארצ, Gen. xi. 1. and 8. which our tranſlators render *the whole earth*, he underſtands *every region*; and by the ſame words in ver. 9. *the whole region* or province. This confuſion was occaſioned, as he ſuppoſes, by a labial failure; ſo that the people could not articulate. Thus their ſpeech was confounded, but not altered; for as ſoon as they ſeparated, they recovered their true tenor of pronunciation, and the language of the earth continued for ſome ages nearly the ſame. The interviews between the Hebrews and other nations, recorded in Scripture, were conducted without an interpreter; and he farther obſerves, that the various languages which ſubſiſt at this day retain ſufficient relation to ſhow, that they were once dialects from the ſame matrix, and that their variety was the effect of time. See DISPERSION.

CONFUTATION, in *Rhetoric*, &c. a part of an oration, wherein the orator ſeconds his own arguments and ſtrengthens his cauſe, by refelling and deſtroying the oppoſite arguments of the antagoniſt. This is done by denying what is apparently falſe, by detecting ſome flaw in the reaſoning of the adverſe party, by granting their argument, and ſhowing its invalidity, or retorting it upon the adverſary.

CONGE, in the French law, a licenſe, or permiſſion, granted by a ſuperior to an inferior, which gives him a diſpenſation from ſome duty to which he was before obliged. A woman cannot obligate herſelf without the *congé* or licenſe of her huſband; a monk cannot go out of his convent, without the *congé* of his ſuperiors.

CONGE' *d'elire*, in eccleſiaſtical policy, the king's permiſſion royal to a dean and chapter in the time of a vacancy, to chooſe a biſhop; or to an abbey, or priory, of his own foundation, to chooſe their abbot or prior.

The king of England, as ſovereign patron of all archbiſhoprics, biſhoprics, and other eccleſiaſtical benefices, had of ancient time free appointment of all eccleſiaſtical dignities, whenſoever they chanced to be void; inveſting them firſt *per bacculum et annulum*, and afterwards by his letters patent; and in courſe of time he made the election over to others, under certain forms and limitations, as that they ſhould at every vacation, before they chooſe, demand the king's congé d'elire, and after the election crave his royal aſſent, &c.

CONGE', in *Architecture*, a mould in form of a quarter round, or a cavetto, which ſerves to ſeparate two members from one another; ſuch as that which joins the ſhaft of the column to the cincture, called alſo *apophyge*.

CONGES are alſo rings or ferrels formerly uſed in the extremities of wooden pillars, to keep them from ſplitting, afterwards imitated in ſtone-work.

CONGELATION, ſignifies the paſſing of any body from a fluid to a ſolid ſtate: ſo that the term is thus applicable to metals when they reſume their ſolid form after being heated, to water when it freezes, to wax, ſpermaceti, &c. when they become ſolid after having been rendered fluid by heat; and in general to all proceſſes, where the whole ſubſtance of the fluid is converted into a ſolid: but it differs from cryſtallization; becauſe in the latter proceſs, though the ſalt paſſes from a fluid to a ſolid ſtate, a conſiderable quantity of liquid is always left, ſo that the term *congelation* is never applied in this caſe.

1
Is always attended with an emiſſion of heat.

The proceſs of congelation in all caſes depends upon, or at leaſt is accompanied with, the emiſſion of heat, as has been evinced by experiments made not only on water, but on ſpermaceti, wax, &c. for in all of theſe, though the thermometer immerſed in them while fluid continued to deſcend gradually till a certain period, yet it was as conſtantly obſerved to remain ſtationary, or even to aſcend while the congelation went on. See CHEMISTRY.

2
Congelation of quickſilver.

It is not known whether all kinds of fluids are naturally capable of congelation or not; though we are certain that there are very great differences among them in this reſpect. The moſt difficult of all thoſe of which the congelation has been actually aſcertained is quickſilver. This was long thought capable of reſiſting any degree of cold whatever; and it is only within a few years that its congelation by artificial means was known, and ſtill more lately that ſome climates were found to be ſo ſevere as to congeal this fluid by the cold of the atmoſphere.

3
Experiments of M. Braun.

The congelation of quickſilver was firſt aſcertained by M. Joſeph Adam Braun, profeſſor of philoſophy at Peterſburg. He had been employed in making thermometrical experiments, not with a view to make the diſcovery he actually did, but to ſee how many degrees of cold he could produce. An excellent opportunity for this occurred on the 14th of December 1759, when the mercury ſtood naturally at —34, which is now known to be only five or ſix degrees above its point of congelation. M. Braun, having determined to avail himſelf of this great degree of natural cold, prepared a freezing mixture of nitric acid and pounded ice, by means of which his thermometer was reduced to —69. Part of the quickſilver had now really congealed; yet ſo far was M. Braun from entertaining any ſuſpicion of the truth, that he had almoſt deſiſted from further attempts, being ſatisfied with having ſo far exceeded all the philoſophers who went before him. Animated, however, by the hopes of producing a ſtill greater degree of cold, he renewed the experiment; but having expended all his pounded ice, he was obliged to ſubſtitute ſnow in its place. With this freſh mixture the mercury ſunk to —100, 240, and 352°. He then ſuppoſed that the thermometer was broken; but on taking it out to obſerve whether it was ſo or not, he found the quickſilver fixed, and continuing ſo for 12 minutes. On repeating the ſame experiment with another thermometer which had been graduated no lower than —120, all the mercury ſunk into the ball, and became ſolid as before, not beginning to reaſcend till after a ſtill longer interval of time. Hence the profeſſor concluded that the quickſilver was really frozen, and prepared for making a deciſive experiment. This was accompliſhed on the 25th of the ſame month, and the bulb of the thermometer broken as ſoon as the metal was congealed. The mercury was now converted into a ſolid and ſhining metallic maſs, which extended under the ſtrokes of a peſtle, in hardneſs rather inferior to lead, and yielding a dull ſound like that metal. Profeſſor Æpinus made ſimilar experiments at the ſame time, employing both thermometers and tubes of a larger bore: in which laſt he remarked, that the quickſilver fell ſenſibly on being frozen, aſſuming a concave ſurface, and likewiſe that the congealed pieces ſunk in fluid mercury.

The fact being thus eſtabliſhed, and fluidity no longer to be conſidered as an eſſential property of quickſilver, M. Braun communicated an account of his experiments to the Peterſburgh Academy, on the 6th of September 1760; of which a large extract was inſerted in the Philoſophical Tranſactions, vol. lii. p. 156. Five years afterwards he publiſhed another treatiſe on the ſame ſubject, under the title of Supplement to his former diſſertation. In this he declared, that, ſince his former publication, he had never ſuffered any winter to elapſe without repeating the experiment of congealing quickſilver, and never failed of ſucceſs when the natural cold was of a ſufficient ſtrength for the purpoſe. This degree of natural cold he ſuppoſes to be —10 of Fahrenheit, though ſome commencement of the congelation might be perceived when the temperature of the air was as high as +2. The reſults of all his experiments were, that with the above-mentioned frigorific mixtures, and once with rectified ſpirits and ſnow, when the natural cold was at 28°, he congealed the quickſilver, and diſcovered that it is a real metal which melts with a very ſmall degree of heat. Not perceiving, however, the neceſſary conſequence of its great contraction in freezing, he, in this work, as well as in the former, confounded its point of congelation with that of its greateſt contraction in freezing, and thus marked the former a great deal too low; though the point of congelation was very uncertain according to him, various difficulties having occurred to his attempts of finding the greateſt point of contraction while freezing.

4 Of Mr Blumenbach. The experiments of M. Braun were not repeated by any perſon till the year 1774, when Mr John Frederic Blumenbach, then a ſtudent of phyſic at Gottingen, performed them to more advantage than it appears M. Braun had ever done. He was encouraged to make the attempt by the exceſſive cold of the winter that year. "I put (ſays he), at five in the evening of January 11th, three drachms of quickſilver into a ſmall ſugar-glaſs, and covered it with a mixture of ſnow and Egyptian ſal-ammoniac. This mixture was put looſe into the glaſs, ſo that the quickſilver lay perfectly free, being only covered with it as by pieces of ice; the whole, together with the glaſs, weighed ſomewhat above an ounce. It was hung out at a window in ſuch a poſition as to expoſe it freely to the north-weſt; and two drachms more of ſal-ammoniac mixed with the ſnow on which it ſtood. The ſnow and ſal-ammoniac, in the open air, ſoon froze into a maſs like ice; no ſenſible change, however, appeared in the quickſilver that evening; but at one in the morning it was found frozen ſolid. It had divided into two large and four ſmaller pieces: one of the former was hemiſpherical, the other cylindrical, each ſeemingly rather above a drachm in weight; the four ſmall bits might amount to half a ſcruple. They were all with their flat ſide frozen hard to the glaſs, and nowhere immediately touched by the mixture; their colour was a dull pale white with a bluiſh caſt, like zinc, very different from the natural appearance of quickſilver. Next morning, about eleven o'clock, I found that the larger hemiſphere began to melt, perhaps becauſe it was moſt expoſed to the air, and not ſo near as the others to the ſal-ammoniac mixture which lay beneath. In this ſtate it reſembled an amalgam, ſinking to that ſide on which the glaſs was inclined; but without quitting the ſurface of the glaſs, to which it was yet firmly congealed: the five other pieces had not yet undergone any alteration, but remained frozen hard. Toward eight o'clock the cylindrical piece began to ſoften in the ſame manner, and the other four ſoon followed. About eight they fell from the ſurface of the glaſs, and divided into many fluid ſhining globules, which were ſoon loſt in the interſtices of the frozen mixture, and reunited in part at the bottom, being now exactly like common quickſilver." At the time this experiment was made, the thermometer ſtood at —10° in the open air.

The circumſtances attending this experiment are ſtill unaccountable; for, in the firſt place, the natural cold was ſcarcely ſufficient, along with that of the artificial mixture, which produces 32° more, to have congealed the quickſilver; which yet appears to have been very effectually done, by the length of time it continued ſolid. 2. It is not eaſy to account for the length of time required for congealing the quickſilver in this experiment, ſince other frigorific mixtures begin to act almoſt immediately; and, 3. There was not at laſt even the appearance of action, which conſiſts in a ſolution of the ſnow, and not in its freezing into a maſs. "The whole experiment (ſays Dr Blagden *) remains involved in ſuch obſcurity, that ſome perſons have ſuppoſed the quickſilver itſelf was not frozen, but only covered over with ice; to which opinion, however, there are great objections. It is worthy of remark, that Gottingen, though ſituated in the ſame latitude as London, and enjoying a temperate climate in general, becomes ſubject at times to a great ſeverity of cold. This of 11th of January 1774 is one inſtance: I find others there where the thermometer ſunk to —12°, —16°, or —19°; and at Cattlenburg, a ſmall town about two German miles diſtant, to —30°. By watching ſuch extraordinary occaſions, experiments on the freezing of quickſilver might eaſily be performed in many places, where the poſſibility of them is at preſent little ſuſpected. The cold obſerved at Glaſgow in 1780 would have been fully ſufficient for that purpoſe."

In conſequence of the publication of M. Braun's Experiments, the Royal Society deſired their late ſecretary Dr Maty to make the neceſſary application to the Hudſon's Bay Company, in order to repeat the experiment in that country. Mr Hutchins, who was then at London, and going out with a commiſſion as governor of Albany fort, offered to undertake the experiments, and executed them very completely*, freezing quickſilver twice in the months of January and February 1775. The account of his ſucceſs was read before the Royal Society at the commencement of the ſevereſt winter that had been known for many years in Europe; and at this time the experiment was repeated by two gentlemen of different countries. One was Dr Lambert Bicker, ſecretary to the Batavian ſociety at Rotterdam; who, on the 28th of January 1776, at eight in the morning, made an experiment to try how low he could bring the thermometer by artificial cold, the temperature of the atmoſphere being then +2°. He could not, however, bring it lower than —94°, at which point it ſtood immoveable; and on breaking the thermometer, part of the quickſilver was found to have loſt its fluidity, and was thickened to the conſiſtence of an amalgam. It fell out of the tube in little bits, which bore to be flattened by preſſure, without running into globules like the inner fluid part. The experiment was repeated next day, when the thermometer ſtood at +8°, but the mercury would not then deſcend below —80°; and as the thermometer was not broken, it could not be known whether the mercury had congealed or not. All that could be inferred from theſe experiments, therefore was, that the congealing point of mercury was not below —94° of Fahrenheit's thermometer. The other who attempted the congelation of this fluid was the late Dr Anthony Fothergill; but it could not be determined whether he ſucceeded or not. An account of his experiments is inſerted in the Philoſophical Tranſactions, vol. lxvi.

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* *Phil. Tranſ.* vol. iii.

No other attempts were made to congeal quickſilver until the year 1781, when Mr Hutchins reſumed the ſubject with great ſucceſs, inſomuch that from his experiments the freezing point of mercury is now almoſt as well ſettled as that of water. Preceding philoſophers, indeed, had not been altogether inattentive to this ſubject. Profeſſor Braun himſelf had taken great pains to inveſtigate it; but for want of paying the requiſite attention to the difference betwixt the contraction of the fluid mercury by cold, and that of the congealing metal by freezing, he could determine nothing certain concerning it. Others declared it as their opinion, that nothing certain could be determined by merely freezing mercury in a thermometer filled with that fluid. Mr Cavendiſh and Dr Black firſt ſuggeſted the proper method of obviating the difficulties on this ſubject. Dr Black, in a letter to Mr Hutchins, dated October 5. 1779, gave the following directions for making the experiment with accuracy: "Provide a few wide and ſhort tubes of thin glaſs, ſealed at one end and open at the other: the wideneſs of theſe tubes may be from half to three quarters of an inch, and the length of them about three inches. Put an inch or an inch and a half depth of mercury into one of theſe tubes, and plunging the bulb of the thermometer into the mercury, ſet the tube with the mercury and the thermometer in it into a freezing mixture, which ſhould be made for this purpoſe in a common tumbler or water glaſs: and, N. B. in making a freezing mixture with ſnow and nitric acid, the quantity of the acid ſhould never be ſo great as to diſſolve the whole of the ſnow, and only enough to reduce it to the conſiſtence of panada. When the mercury in the wide tube is thus ſet in the freezing mixture, it muſt be ſtirred gently and frequently with the bulb of the thermometer; and if the cold be ſufficiently ſtrong, it will congeal by becoming thick like an amalgam. As ſoon as this is obſerved, the thermometer ſhould be examined without lifting it out of the congealing mercury; and I have no doubt that in every experiment thus made, with the ſame mercury, the inſtrument will always point to the ſame degree, provided it has been made and graduated with accuracy."

5
Dr Black's directions for making the experiment.

6
Apparatus recommended by Mr Cavendiſh.

The apparatus recommended by Mr Cavendiſh, and which Mr Hutchins made uſe of, conſiſted of a ſmall mercurial thermometer, the bulb of which reaches about 2½ inches below the ſcale, and was incloſed in a glaſs cylinder ſwelled at the bottom into a ball, which when uſed was filled with quickſilver, ſo that the bulb of the thermometer was entirely covered with it. If this cylinder be immerſed in a freezing mixture till great part of the quickſilver in it is frozen, it is evident that the degree ſhown at that time by the incloſed thermometer is the preciſe point at which mercury freezes; for as in this caſe the ball of the thermometer muſt be ſurrounded for ſome time with quickſilver, part of which is actually frozen, it ſeems impoſſible that the thermometer ſhould be ſenſibly above that point; and while any of the quickſilver in the cylinder remains fluid, it is impoſſible that it ſhould ſink ſenſibly below it. The diameter of the bulb of the thermometer was rather leſs than a quarter of an inch, that of the ſwelled part of the cylinder two-thirds; and as it was eaſy to keep the thermometer conſtantly in the middle of the cylinder, the thickneſs of quickſilver betwixt it and the glaſs could never be much leſs than the ſixth part of an inch. The bulb of the thermometer was purpoſely made as ſmall as it conveniently could, in order to leave a ſufficient ſpace between it and the cylinder, without making the ſwelled part larger than neceſſary, which would have cauſed more difficulty in freezing the mercury in it.

The firſt experiment with this apparatus was made on the 15th of December 1781; the thermometer had ſtood the evening before at —18°. A bottle of ſpiritus nitri fortis was put on the houſe-top, in order to cool it to the ſame temperature. The thermometers made uſe of had been hung up in the open air for three weeks, to compare their ſcales. On the morning of the experiment they were about 23° below 0.——In making it, the thermometer of the apparatus was ſuſpended in the bulb of the cylinder by means of ſome red worſted wound about the upper part of its ſtem, to a ſufficient thickneſs to fill the upper part of its orifice; and a ſpace of near half an inch was left empty between the quickſilver and worſted.

The apparatus was placed in the open air, on the top of the fort, with only a few deer ſkins ſewed together for a ſhelter; the ſnow lay 18 inches deep on the works, and the apparatus was ſtuck into the ſnow, in order to bring it the ſooner to the temperature of the air. The inſtruments were afterwards placed in three freſh freezing mixtures, in hopes of being able by their means to produce a greater degree of cold, but without effect; nor was any greater cold produced by adding more nitric acid. The mercury, however, was very completely frozen, that in the thermometer deſcending to 448°. On plunging the mercury into the freezing mixture, it deſcended in leſs than one minute to 40° below 0.

The ſecond experiment was made the day following; and the ſame quantity of quickſilver employed that had been uſed in the former. As too ſmall a quantity of the freezing mixture, however, had been originally made, it was neceſſary to add more during the operation of congelation; by which means the ſpirit of nitre, in pouring it upon the ſnow, ſometimes touched the bulb of the thermometer, and inſtantly raiſed it much higher; nor did the mercury ever deſcend below 206°, which was not half as far as it had done the day before, though the temperature of the atmoſphere had been this day at —34° before the commencement of the operation. That in the apparatus, however, ſunk to —95°. The apparatus was taken out of the mixture for half a minute, in order to examine whether the mercury was perfectly congealed or not, and, during that time, it ſhowed no ſign of liquefaction.

The third experiment was made the ſame day, and with the freezing mixture uſed in the laſt. By it the point of congelation was determined to be not below 40°.

The fourth experiment was made January 7th 1782;

and in it he obſerved, that the mercury in the apparatus thermometer, after ſtanding at 42 and 41½ for a conſiderable time, fell to 77, not gradually, but at once as a weight falls.

In the fifth experiment the weather was exceſſively ſevere, ſo that it ought to have frozen the metal in the open air; but this did not then happen.

At the time of making the ſixth experiment, the quickſilver in the open air ſtood at 44 below 0; and Mr Hutchins reſolved to make uſe of this opportunity to obſerve how far it was poſſible to make it deſcend by means of cold, obſerving the degrees at the ſame time with a ſpirit thermometer made by Nairne and Blount, with which he had been furniſhed by the Royal Society in 1774. In this, however, he did not ſucceed; for the mercury never fell below 438, nor the ſtandard 48. It ſtood at 27½ at the beginning of the experiment. The reaſon of this was ſuppoſed to be, that the atmoſphere was too cold for making this kind of experiment, by reaſon of its freezing the thread of quickſilver in the ſtem of the thermometer, ſo that it became incapable of contraction along with that in the bulb. In other experiments, though the metal in the bulb became ſolid, yet that in the ſtem always remained fluid; and thus was enabled to ſubſide to a great degree by the diminution of bulk in the ſolid mercury. That this was really the caſe, appeared from the quickſilver falling at once from —86 to —434, when the cold of the freezing mixture diminiſhed, and the temperature of the air becoming about the ſame time ſomewhat milder, melted the congealed part in the ſtem, which thus had liberty to deſcend to that point.

In this experiment, alſo, the mixtures were made in double quantity to thoſe of the former; theſe being only in common tumblers, but the mixtures for this experiment in pint baſons. It was obſerved that they liquefied faſter than in other experiments. He had uſually made them of the conſiſtence of pap; but though he added ſnow at different times, it had very little effect in augmenting the cold, but rather decreaſed it. The congealed pieces of the metal fell to the bottom, as might naturally have been expected from its great contraction in becoming ſolid.

From this experiment Mr Hutchins concluded, that the nearer the temperature of the atmoſphere approached to the congealing point of mercury (ſo that a great degree of cold might be communicated to the bulb of a thermometer, and yet the quickſilver in the tube remain fluid), he might make the experiment of aſcertaining the greateſt contraction of mercury to more advantage. With this view, he made another experiment, when the temperature of ſome of his thermometers ſtood as low as —37°; and after an hour's attendance, he perceived the mercury had fallen to 1367; but the thermometer unluckily was broken, and its bulb thrown away with the mixture. Profeſſor Braun had likewiſe obſerved, that his thermometers were always broken when the mercury deſcended below 600.

The eighth experiment was made with a view to try whether quickſilver would congeal when in contact with the freezing mixture. For this puurpoſe, he did not uſe the apparatus provided for other experiments, but filled a gallipot made of flint ſtone (as being thinner than the common ſort), containing about an ounce, half full of quickſilver, into which he inſerted a mercurial thermometer, employing another as an index. Thus he hoped to determine exactly when the quickſilver was congealed, as he had free acceſs to it at all times, which was not the caſe when it was incloſed in the cylindrical glaſs, the worſted wound round the tube of the thermometer to exclude the air being equally effectual in excluding any inſtrument from being introduced to touch the quickſilver. He then made a kind of ſkewer, with a flat blunt point, of dried cedar-wood, on account of its lightneſs, which he found would remain in the gelatinous freezing mixture at any depth he choſe; but, when inſerted into the quickſilver, the great difference betwixt the ſpecific gravity of it and that ponderous fluid, made it always rebound upward; and by the degree of reſiſtance, he could always know whether it proceeded from fluid or ſolid metal. At this time, however, the experiment did not ſucceed; but, at another trial, having employed about ¾ths of a pound of metal, and let it remain a conſiderable time immerſed in the ſame mixture which had juſt now been ſuppoſed to fail, he found that part of it was congealed; and, on pouring off the fluid part, no leſs than two-thirds remained fixed at the bottom.

7
Mr Cavendiſh's experiments.

The laſt experiment which has been publiſhed concerning the congelation of quickſilver by means of ſnow, is that of Mr Cavendiſh, and of which he gives an account in the Phil. Tranſact. vol. lxxiii. p. 325. Here, ſpeaking of the cold of freezing mixtures, he ſays. "There is the utmoſt reaſon to think that Mr Hutchins would have obtained a greater degree of cold by uſing a weaker nitrous acid than he did. I found (ſays he) by adding ſnow gradually to ſome of this acid, that the addition of a ſmall quantity produced heat inſtead of cold; and it was not until ſo much was added as to increaſe the heat from 28 to 51°, that the addition of more ſnow began to produce cold; the quantity of ſnow required for this purpoſe being pretty exactly one quarter of the weight of the ſpirit of nitre; and the heat of the ſnow, and air of the room, as well as of the acid, being 28°. The reaſon of this is, that a great deal of heat is produced by mixing water with ſpirit of nitre; and the ſtronger the ſpirit is, the greater is the heat produced. Now it appears from this experiment, that before the acid was diluted, the heat produced by its union with the water formed from the melting ſnow, was greater than the cold produced by the ſame; and it was not until it was diluted by the addition of one quarter of its weight of that ſubſtance, that the cold, generated by the latter cauſe, began to exceed the heat generated by the former. From what has been ſaid, it is evident, that a freezing mixture made with undiluted acid will not begin to generate cold until ſo much ſnow is diſſolved as to increaſe its heat from 28 to 51°; ſo that no greater cold will be produced than would be obtained by mixing the diluted acid heated to 51° with ſnow of the heat of 28°. This method of adding ſnow gradually is much the beſt way I know of finding what ſtrength it ought to be of, in order to produce the greateſt effect poſſible. By means of this acid diluted in the above-mentioned proportion, I froze quickſilver in the thermometer called G (A) by Mr Hutchins, on the 26th of February 1782. I did not indeed break the thermometer to examine the ſtate of the quickſilver therein; for, as it ſunk to —110°, it certainly muſt have been in part frozen; but immediately took it out, and put the ſpirit thermometer in its room, in order to find the cold of the mixture. It ſunk only to —30°; but by making allowance of the ſpirit in the tube being not ſo cold as that in the ball, it appears, that if it had not been for this cauſe, it would have ſunk to —35° (B); which is 6° below the point of freezing, and is within one degree of as great a cold as that produced by Mr Hutchins.

"In this experiment the thermometer G ſunk very rapidly; and, as far as I could perceive, without ſtopping at any intermediate point till it came to the above-mentioned degree of —110°, where it ſtuck. The materials uſed in making the mixture were previouſly cooled, by means of ſalt and ſnow, to near 0; and the temperature of the air was between 20° and 25°; the quantity of acid uſed was 4½ oz.; and the glaſs in which the mixture was made, was ſurrounded with wool, and placed in a wooden box, to prevent its loſing its cold ſo faſt as it would otherwiſe have done. Some weeks before this I made a freezing mixture with ſome ſpirit of nitre much ſtronger than that uſed in the foregoing experiment, though not quite ſo ſtrong as the undiluted acid, in which the cold was leſs intenſe by 4½°. It is true the temper of the air was much leſs cold, namely 35°, but the ſpirit of nitre was at leaſt as cold, and the ſnow not much leſs ſo.

"The cold produced by mixing ſulphuric acid, properly diluted with ſnow, is not ſo great as that produced by ſpirit of nitre, though it does not differ from it by ſo much as 8°; for a freezing mixture, prepared with diluted ſulphuric acid, whoſe ſpecific gravity, at 60° of heat, was 1,5642, ſunk in the thermometer G to —37°, the experiment being tried at the ſame time, and with the ſame precautions, as the foregoing. It was previouſly found, by adding ſnow gradually to ſome of this acid, as was done by the nitrous acid, that it was a little, but not much ſtronger, than it ought to be, in order to produce the greateſt effect."

The experiment made by Mr Walker, in which he congealed quickſilver by means of nitric acid and Glauber's ſalt, without any ſnow, concludes the hiſtory of the artificial congelation of mercury. It now remains that we ſay ſomething of the congelation of it by the natural cold of the atmoſphere.

8
Congelation of quickſilver by natural cold.

Dr Blagden, from whoſe paper in the Philoſophical Tranſactions, vol. lxxiii. this account is taken, obſerves, that it was not till near the year 1730 that thermometers were made with any degree of accuracy; and in four or five years after this, the firſt obſervations were made which prove the freezing of quickſilver. On the acceſſion of the empreſs Anne Ivanouna to the throne of Ruſſia, three profeſſors of the Imperial academy were choſen to explore and deſcribe the different parts of her Aſiatic dominions, and to inquire into the communication betwixt Aſia and America. Theſe were Dr John George Gmelin, in the department of natural hiſtory and chemiſtry; M. Gerard Frederic Muller, as general hiſtoriographer; and M. Louis de l'Iſle de la Croyere, for the department of aſtronomy; draughtſmen and other proper aſſiſtants being appointed to attend them. They departed from Peterſburgh in 1733; and ſuch as ſurvived did not return till ten years after. The thermometrical obſervations were communicated by Profeſſor Gmelin, who firſt publiſhed them in his Flora Sibirica, and afterwards more fully in the Journal of his Travels. An abſtract of them was likewiſe inſerted in the Peterſburgh Commentaries for the years 1756 and 1765, taken, after the profeſſor's death, from his original diſpatches in poſſeſſion of the Imperial academy.

In the winter of 1734 and 1735, Mr Gmelin being at Yeneſeiſk in 58¼° N. Lat. and 92° E. Long. from Greenwich, firſt obſerved ſuch a deſcent of the mercury, as we know muſt have been attended with congelation. "Here (ſays he) we firſt experienced the truth of what various travellers have related with reſpect to the extreme cold of Siberia; for, about the middle of December, ſuch ſevere weather ſet in, as we were ſure had never been known in our time at Peterſburgh. The air ſeemed as if it were frozen, with the appearance of a fog, which did not ſuffer the ſmoke to aſcend as it iſſued from the chimneys. Birds fell down out of the air as dead, and froze immediately, unleſs they were brought into a warm room. Whenever the door was opened, a fog ſuddenly formed round it. During the day, ſhort as it was, parhelia and haloes round the ſun were frequently ſeen; and in the night mock-moons, and haloes about the moon. Finally, our thermometer, not ſubject to the ſame deception as the ſenſes, left us no doubt of the exceſſive cold; for the quickſilver in it was reduced on the 5th of January O. S. to —120° of Fahrenheit's ſcale, lower than it had ever hitherto been obſerved in nature."

9
Exceſſive cold of Siberia.

The next inſtance of congelation happened at Yakutſk, in N. Lat. 62. and E. Long. 130. The weather here was unuſually mild for the climate, yet the thermometer fell to —72°; and one perſon informed the profeſſor by a note, that the mercury in his barometer was frozen. He haſtened immediately to his houſe to behold ſuch a ſurpriſing phenomenon; but though he was witneſs to the fact, the prejudice he entertained againſt the poſſibility of the congelation, would not allow him to believe it. "Not feeling (ſays he), by the way, the ſame effects of cold as I had experienced at other times in leſs diſtances, I began, before my arrival, to entertain ſuſpicions about the congelation of his quickſilver. In fact, I ſaw that it did not continue in one column, but was divided in different places as into little cylinders, which appeared frozen; and, in ſome of theſe diviſions between the quickſilver, I perceived like the appearance of frozen moiſture.

(A) This was a ſmall mercurial thermometer, made by Nairne and Blount, on an ivory ſcale, divided at every five degrees, and reaching from 215° above to 250° below the cipher.

(B) This is to be underſtood of a ſpirit thermometer, whoſe —29°=40° of Fahrenheit's mercurial.

Congelation.

moiſture. It immediately occurred to me, that the mercury might have been cleaned with vinegar and ſalt, and not ſufficiently dried. The perſon acknowledged it had been purified in that manner. This ſame quickſilver, taken out of the barometer, and well dried, would not freeze again, though expoſed to a much greater degree of cold, as ſhown by the thermometer."

Another ſet of obſervations, in the courſe of which the mercury frequently congealed, were made by Profeſſor Gmelin at Kirenga fort in 57½ N. Lat. 108. E. Long.; his thermometer, at different times, ſtanding at —108°, —86°, —100°, —113°, and many other intermediate degrees This happened in the winter of 1737 and 1738. On the 27th of November, after the thermometer had been ſtanding for two days at —46°, he found it ſunk at noon to 108°. Suſpecting ſome miſtake, after he had noted down the obſervation, he inſtantly ran back, and found it at 102°; but aſcending with ſuch rapidity, that in the ſpace of half an hour it had riſen to —19°. This phenomenon, which appeared ſo ſurpriſing, undoubtedly depended on the expanſion of the mercury frozen in the bulb of the thermometer, and which now melting, forced upwards the ſmall thread in the ſtem.

A ſimilar appearance was obſerved at the ſame fort a few days after; and on the 29th of December, O. S. he found the mercury, which had been ſtanding at —40° in the morning, ſunk to —100° at four in the afternoon. At this time, he ſays, he "ſaw ſome air in the thermometer ſeparating the quickſilver for the ſpace of about ſix degrees." He had taken notice of a ſimilar appearance the preceding evening, excepting that the *air*, as he ſuppoſed it to be, was not then collected into one place, but lay ſcattered in ſeveral.

Theſe appearances undoubtedly proceeded from a congelation of the mercury, though the prejudice entertained againſt the poſſibility of this phenomenon would not allow the profeſſor even to inquire into it at all. Several other obſervations were made; ſome of which were loſt, and the reſt contain no farther information.

The ſecond inſtance where a natural congelation of mercury has certainly been obſerved, is recorded in the Tranſactions of the Royal Academy of Sciences at Stockholm. The weather, in January 1760, was remarkably cold in Lapland; ſo that, on the 5th of that month, the thermometers fell to —76°, —128°, or lower; on the 23d and following days they fell to —58°, —79°, —92°, and below —238° entirely into the ball. This was obſerved at Tornea, Sombio, Jakaſierf, and Utſioki, four places in Lapland, ſituated between the 65th and 78th degrees of N. Lat. and the 21ſt and 28th of E. Long. The perſon who obſerved them was M. Andrew Hellant, who makes the following remarks, of themſelves ſufficient to ſhow that the quickſilver was frozen. "During the cold weather at Sombio (ſays he), as it was clear ſunſhine, though ſcarcely the whole body of the ſun appeared above the low woods that covered our horizon, I took a thermometer which was hanging before in the ſhade, and expoſed it to the riſing ſun about eleven in the forenoon, to ſee whether, when that luminary was ſo low, it would have any effect upon the inſtrument. But to my great ſurpriſe, upon looking at it about noon, I found that the mercury had entirely ſubſided into the ball, though it was ſtanding as high as —61° at 11 o'clock, and the ſcale reached down to 238° below 0." On bringing the inſtrument near a fire, it preſently roſe to its uſual height; and the reaſon of its ſubſiding before was its being ſomewhat warmed by the rays of the ſun; which, feeble as they were, had yet ſufficient power to melt the ſmall thread of congealed mercury in the ſtem of the thermometer, and allow it to ſubſide along with the reſt. Mr Hellant, however, ſo little underſtood the reaſon of this phenomenon, that he frequently attempted to repeat it by bringing the thermometer near a fire, when the cold was only a few degrees below the freezing point of water, but could never ſucceed until it fell to —58°, or lower, that is, until the cold was ſufficiently intenſe to congeal the metal. The only ſeeming difficulty in his whole account is, that when the mercury had ſubſided entirely into the ball of the thermometer, a vacuum or empty ſpot appeared, which run round the cavity like an air bubble, on turning the inſtrument; but this proceeded from a partial liquefaction of the mercury, which muſt neceſſarily melt firſt on the outſide, and thus exhibit the appearance juſt mentioned. 10

Remarkable experiments of Dr Pallas.

The moſt remarkable congelation of mercury, which has ever yet been obſerved, was that related by Dr Peter Simon Pallas, who had been ſent by the empreſs of Ruſſia, with ſome other gentlemen, on an expedition ſimilar to that of Dr Gmelin. He did not, however, ſpend the winters in which he was in Siberia in the coldeſt parts of that country; that is, about the middle of the northern part. Twice indeed he reſided at Kraſnoyarſk, in N. Lat. 56½°, E. Long. 93°; where, in the year 1772, he had an opportunity of obſerving the phenomenon we ſpeak of. "The winter (ſays he) ſet in early this year, and was felt with uncommon ſeverity in December. On the 6th and 7th of that month happened the greateſt cold I have ever experienced in Siberia; the air was calm at the time, and ſeemingly thickened; ſo that, though the ſky was in other reſpects clear, the ſun appeared as through a fog. I had only one ſmall thermometer left, in which the ſcale went no lower than —7°; and on the 6th in the morning, I remarked that the quickſilver in it ſunk into the ball, except ſome ſmall columns which ſtuck faſt in the tube. When the ball of the thermometer, as it hung in the open air, was warmed by being touched with the finger, the quickſilver roſe; and it could plainly be ſeen, that the ſolid columns ſtuck and reſiſted a good while, and were at length puſhed upward with a ſort of violence. In the mean time I placed upon the gallery, on the north ſide of my houſe, about a quarter of a pound of clean and dry quickſilver in an open bowl. Within an hour I found the edges and ſurface of it frozen ſolid, and ſome minutes afterwards the whole was condenſed by the natural cold into a ſoft maſs very much like tin. While the inner part was ſtill fluid, the frozen ſurface exhibited a great variety of branched wrinkles; but in general it remained pretty ſmooth in freezing, as did alſo a larger quantity which I afterwards expoſed to the cold. The congealed mercury was more flexible than lead; but on being bent ſhort, it was found more brittle than tin; and when hammered out thin, it ſeemed ſomewhat granulated. If the hammer had not been perfectly cooled, the quickſilver melted away under it in drops; and the ſame thing happened when the metal was touched with the finger, by which alſo the finger was immediately benumbed. In our warm room it thawed on its ſurface gradually, by drops, like wax on the fire, and did not melt all at once. When the frozen maſs was broken to pieces in the cold, the fragments adhered to each other and to the bowl on which they lay. Although the froſt ſeemed to abate a little towards night, yet the congealed quickſilver remained unaltered, and the experiment with the thermometer could ſtill be repeated. On the 7th of December, I had an opportunity of making the ſame obſervations all day; but ſome hours after ſunſet, a north-weſt wind ſprung up, which raiſed the thermometer to —46°, when the maſs of quickſilver began to melt."

19 Von Elterlein's experiment.

In the beginning of the year 1780 M. Von Elterlein, of Vytegra, a town of Ruſſia, in N. Lat 61. E. Long. 36. froze quickſilver by natural cold; of which he gives the following account. "On the 4th of January 1780, the cold having increaſed to —34° that evening at Vytegra, I expoſed to the open air three ounces of very pure quickſilver in a china tea-cup, covered with paper pierced full of holes. Next day, at eight in the morning, I found it ſolid, and looking like a piece of caſt lead, with a conſiderable depreſſion in the middle. On attempting to looſen it in the cup, my knife raiſed ſhavings from it as if it had been lead, which remained ſticking up; and at length the metal ſeparated from the bottom of the cup in one maſs. I then took it in my hand to try if it would bend: it was ſtiff like glue, and broke into two pieces; but my fingers immediately loſt all feeling, and could ſcarcely be reſtored in an hour and a half by rubbing with ſnow. At eight o'clock a thermometer, made by Mr Lexmann of the academy, ſtood at —57°; by half after nine it was riſen to —40°; and then the two pieces of mercury which lay in the cup had loſt ſo much of their hardneſs, that they could no longer be broken, or cut into ſhavings, but reſembled a thick amalgam, which, though it became fluid when preſſed by the fingers, immediately afterwards reſumed the conſiſtence of pap. With the thermoteter at —39°, the quickſilver became fluid. The cold was never leſs on the 5th than —28°, and by nine in the evening it had increaſed again to —33°."

An inſtance of the natural congelation of quickſilver alſo occurred in Jemtland, one of the provinces of Sweden, on the 1ſt of January 1782; and laſtly, on the 26th of the ſame month, Mr Hutchins obſerved the ſame effect of the cold at Hudſon's bay.

20 Experiment of Mr Hutchins.

"The ſubject of this curious phenomenon (ſays he), was quickſilver put into a common two-ounce phial, and corked. The phial was about a third part full, and had conſtantly been ſtanding by the thermometer for a month paſt. At eight o'clock this morning I obſerved it was frozen rather more than a quarter of an inch thick round the ſides and bottom of the phial, the middle part continuing fluid. As this was a certain method of finding the point of congelation, I introduced a mercurial and a ſpirit thermometer into the fluid part, after breaking off the top of the phial, and they roſe directly and became ſtationary; the former at 40° or 40½°, the latter at 29¼°, both below the cypher. Having taken theſe out, I put in two others, G a mercurial one formerly deſcribed, and a ſpirit thermometer; the former of which became ſtationary at 40° and the latter at 30°. I then decanted the fluid quickſilver, to examine the internal ſurface of the frozen metal, which proved very uneven, with many radii going acroſs, ſome of which reſembled pin-heads. Urgent buſineſs called me away an hour. On my return I found a ſmall portion only had liquefied in my abſence. I then broke the phial entirely, and with a hammer repeatedly ſtruck the quickſilver. It beat out flat, yielded a deadiſh ſound, and became fluid in leſs than a minute afterwards. It may be worth remarking, that the quickſilver in one of the thermometers, which had ſunk to very near 500, and was then at 444, very readily run up and down the tube by elevating either end of the inſtrument."

Theſe are all the well-authenticated accounts of the congelation of mercury by the natural cold of the atmoſphere. Some others have been publiſhed; but being either leſs important, or not ſo well authenticated, we forbear to mention them. A very conſiderable confirmation is obtained from the above hiſtory, of the theory of congelation delivered by Dr Black, and which is fully explained under the article CHEMISTRY. On Mr Hutchins's experiments, and on congelation in general, Mr Cavendiſh makes many valuable remarks; the ſubſtance of which is as follows:

21 Mr Cavendiſh's remarks on congelation.

"If a veſſel of water, with a thermometer in it, be expoſed to the cold, the thermometer will ſink ſeveral degrees below the freezing point, eſpecially if the water be covered up ſo as to be defended from the wind, and care taken not to agitate it; and then on dropping in a bit of ice, or on mere agitation, ſpiculæ of ice ſhoot ſuddenly through the water, and the incloſed thermometer riſes quickly to the freezing point, where it remains ſtationary. In a note he ſays, that though in conformity to the common opinion he has allowed that "mere agitation may ſet the water a freezing, yet ſome experiments lately made by Dr Blagden ſeem to ſhow, that it has not much, if any, effect of that kind, otherwiſe than by bringing the water in contact with ſome ſubſtance colder than itſelf. Though in general alſo the ice ſhoots rapidly, and the incloſed thermometer riſes very quick; yet he once obſerved it to riſe very ſlowly, taking up not leſs than half a minute, before it aſcended to the freezing point; but in this experiment the water was cooled not more than one or two degrees below freezing; and it ſhould ſeem, that the more the water is cooled below the freezing point, the more rapidly the ice ſhoots and the incloſed thermometer riſes."

Mr Cavendiſh then obſerves, that from the foregoing experiments we learn that water is capable of being cooled conſiderably below the freezing point, without any congelation taking place; and that, as ſoon as by any means a ſmall part of it is made to freeze, the ice ſpreads rapidly through the whole of the water. The cauſe of this riſe of the thermometer is, that all, or almoſt all bodies, by changing from a fluid to a ſolid ſtate, or from the ſtate of an elaſtic to that of an unelaſtic fluid, generate heat; and that cold is produced by the contrary proceſs. Thus all the circumſtances of the phenomenon may be perfectly well explained; for, as ſoon as any part of the water freezes, heat will be generated thereby in conſequence of the above-mentioned law, ſo that the new formed ice and remaining water will be warmed, and muſt continue to receive heat by the freezing of freſh portions of water, till it is heated exactly to the freezing point, unleſs the water could become quite ſolid before a ſufficient quantity of heat was generated to raiſe it to that point, which is not the caſe: and it is evident, that it cannot be heated above the freezing point: for as ſoon as it comes thereto, no more water will freeze, and conſequently no more heat will be generated.—The reaſon why the ice ſpreads all over the water, inſtead of forming a ſolid lump in one part, is, that, as ſoon as any ſmall portion of ice is formed, the water in contact with it will be ſo much warmed as to be prevented from freezing, but the water at a little diſtance from it will ſtill be below the freezing point, and will conſequently begin to freeze.

"Were it not for this generation of heat, the whole of any quantity of water would freeze as ſoon as the proceſs of congelation began; and in like manner the cold is generated by the melting of ice; which is the cauſe of the long time required to thaw ice and ſnow. It was formerly found that, by adding ſnow to warm water, and ſtirring it about until all was melted, the water was as much cooled as it would have been by the addition of the ſame quantity of water rather more than 150° degrees colder than the ſnow; or, in other words, ſomewhat more than 150° of cold are generated by the thawing of the ſnow; and there is great reaſon to believe that juſt as much heat is produced by the freezing of water. The cold generated in the experiment juſt mentioned was the ſame whether ice or ſnow was uſed.

22
On metals when beginning to turn ſolid.

"A thermometer kept in melted tin or lead till they become ſolid, remains perfectly ſtationary from the time the metal begins to harden round the ſides of the pot till it is entirely ſolid; but it cannot be perceived at all to ſink below that point, and riſe up to it when the metal begins to harden. It is not unlikely, however, that the great difference of heat between the air and melted metal might prevent this effect from taking place; ſo that though it was not perceived in theſe experiments, it is not unlikely that thoſe metals, as well as water and quickſilver, may bear being cooled a little below the freezing or hardening point (for the hardening of melted metals, and freezing of water, ſeems exactly the ſame proceſs,) without beginning to loſe their fluidity.

"The experiments of Mr Hutchins prove, that quickſilver contracts or diminiſhes in bulk by freezing, and that the very low degrees to which the thermometers have been made to ſink, is owing to this contraction, and not to the cold having been in any degree equal to that ſhown by the thermometer. In the fourth experiment, one of the thermometers ſunk to 450°, though it appeared, by the ſpirit thermometers, that the cold of the mixture was not more than five or ſix degrees below the point of freezing quickſilver. In the firſt experiment alſo, it ſunk to 448°, at a time when the cold of the mixture was only 2¼° below that point; ſo that it appears that the contraction of quickſilver by freezing muſt be at leaſt equal to its expanſion by 404 degrees of heat (A). This, however, is not the whole contraction that it ſuffers; for it appears by an extract from a meteorological journal kept by Mr Hutchins at Albany fort, that his thermometer once ſunk to 490° below 0; though it was known by a ſpirit thermometer that the cold ſcarcely exceeded the point of freezing quickſilver. There are two experiments alſo of Profeſſor Braun, in which the thermometer ſunk to 544 and 556° below 0; which is the greateſt deſcent he ever obſerved without the ball being cracked. It is not indeed known how cold his mixtures were; but from Mr Hutchins's experiments, there is great reaſon to think they could not be many degrees below 40°. If ſo, the contraction which quickſilver ſuffers in freezing, is not much leſs than its expanſion by 500° or 510° of heat, that is, almoſt $\frac{1}{28}$ of its whole bulk; and in all probability is never much more than that, though it is probable that this contraction is not always determinate; for a conſiderable variation may frequently be obſerved in the ſpecific gravity of the ſame piece of metal caſt different times over; and almoſt all caſt metals become heavier by hammering. Mr Cavendiſh obſerved, that on caſting the ſame piece of tin three times over, its denſity varied from 7.252 to 7.294, though there was great reaſon to think that no hollows were left in it, and that only a ſmall part of this difference could proceed from the error of the experiment. This variation of denſity is as much as is produced in quickſilver by an alteration of 66° of heat: and it is not unlikely, that the deſcent of a thermometer, on account of the contraction of the quickſilver in its ball by freezing, may vary as much in different trials, though the whole maſs of quickſilver is frozen without any vacuities.

23
Variation of the denſity of metals by frequent caſting.

24
Of freezing mixtures.

"The cold produced by mixing ſpirit of nitre with ſnow is entirely owing to the melting of the ſnow. Now, in all probability, there is a certain degree of cold, in which the ſpirit of nitre, ſo far from diſſolving ſnow, will yield part of its own water, and ſuffer that to freeze, as is the caſe with ſolutions of common ſalt; ſo that if the cold of the materials before mixing is equal to this, no additional cold can be produced. If the cold of the materials is leſs, ſome increaſe of cold will be produced; but the total cold will be leſs than in the former caſe, ſince the additional cold cannot be generated without ſome of the ſnow being diſſolved, and thereby weakening the acid, and making it leſs able to diſſolve more ſnow; but yet the leſs the cold of the materials is, the greater will be the additional cold produced. This is conformable to Mr Hutchins's experiments; for in the fiſth experiment, in

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(A) The numbers here given are thoſe ſhown by the thermometer without any correction; but if a proper allowance is made for the error of that inſtrument, it will appear, that the true contraction was 25° leſs than here ſet down; and from the manner in which thermometers have been uſually adjuſted, it is likely that in the 5th experiment of Mr Hutchins, as well as in thoſe of Profeſſor Braun, the true contraction might equally fall ſhort of that by obſervation.

Congelation.

in which the cold of the materials was −40°, the additional cold produced was only 5°. In the firſt experiment, in which the cold of the materials was only −23°, an addition of at leaſt 19° of cold was obtained; and by mixing ſome of the ſame ſpirit of nitre with ſnow in this climate, when the heat of the materials was +26°, Mr Cavendiſh was able to ſink the thermometer to −29°, ſo that an addition of 55 degrees of cold was produced.

"It is remarkable that in none of Mr Hutchins's experiments the cold of the mixture was mote than 6° of the ſpirit thermometer below the freezing point of quickſilver; which is ſo little, that it might incline one to think that the ſpirit of nitre uſed by him was weak. This, however, was not the caſe; as its ſpecific gravity at 58° of heat was 1,4923. It was able to diſſolve $\frac{1}{1.42}$ its weight of marble, and contained very little mixture of ſulphuric or muriatic acid; as well as could be judged from an examination of it, it was as little phlogiſticated as acid of that ſtrength uſually is."

25 Congelation of ſulphuric acid. Acids, eſpecially thoſe of the mineral kind, powerfully reſiſt congelation. There is, however, a peculiarity with regard to that of vitriol. M. Chaptal, a foreign chemiſt, obſerved, that it condenſed by the cold of the atmoſphere, and the cryſtals began to melt only at +70° of his thermometer; which, if Reaumut's, correſponds to about 47° of Fahrenheit. The cryſtals were unctuous from the melting acid, and they felt warmer than the neighbouring bodies: the form was that of a priſm of ſix ſides, flatted and terminated by a pyramid of ſix ſides; but the pyramid appeared on one end only; on the other, the cryſtal was loſt in the general maſs. The pyramid reſulted from an aſſemblage of ſix iſoſceles triangles; the oil, when the cryſtal was melted was of a yellowiſh black; on rediſtilling it in a proper apparatus, no peculiar gas came over. M. Chaptal repeated his experiments with the highly concentrated acid, but found that it did not freeze; that the denſity of the acid which he thought froze moſt eaſily was to the oil, of the uſual ſtrength for ſale, as from 63 and 65 to 66; and the neceſſary degree of cold about 19° of Fahrenheit. Sulphuric acid once melted will not cryſtallize again with the ſame degree of cold.

26 Mr Keir's experiments. In the experiments which had been made on the freezing of ſulphuric acid, Mr Cavendiſh found ſome uncertainty in determining the point at which it freezes moſt readily; neither could he determine whether the cold neceſſary for congelation does not increaſe without any limitation in proportion to the ſtrength of the acid. A new ſet of experiments were therefore made by Mr Keir to determine this point. He had obſerved, after a ſevere froſt at the end of the year 1784 and beginning of 1785, that ſome ſulphuric acid, contained in a corked phial, had congealed, while other bottles containing the ſame, ſome ſtronger and ſome weaker, retained their fluidity. As the congelation was naturally imputed to the extremity of the cold, he was afterwards ſurpriſed to find, when the froſt ceaſed, that the acid remained congealed for many days, when the temperature of the atmoſphere was ſometimes above 40° of Fahrenheit; and when the congealed acid was brought into a warm room on purpoſe to thaw it, a thermometer placed in contact with it during its thawing continued ſtationary at 45°. Hence he concluded, that the freezing and thawing point of this acid was nearly at 45°; and accordingly, on expoſing the liquor which had been thawed to the air at the temperature of 30°, the congelation again took place in a few hours. From the circumſtance of other parcels of the ſame acid, but of different ſtrengths, remaining fluid, though they had been expoſed to a much greater degree of cold, he was led to believe that there muſt be ſome certain ſtrength at which the acid is more diſpoſed to congeal than at any other. The ſpecific gravity of the acid which had frozen was to that of water nearly as 1800 to 1000, and that of the ſtronger acid which had not frozen was as 1846 to 1000, which is the common denſity of that uſually ſold in England; and there was not the leaſt difference, excepting in point of ſtrength, between the acid which had frozen and that which had not; Mr Keir having taken the acid ſome weeks before with his own hands from the bottle which contained the latter, and diluted it with water, till it became of the ſpecific gravity of 1800.

To render the experiment complete, Mr Keir immerſed ſeveral acids of different ſtrengths in melting ſnow, inſtead of expoſing them to the air; the temperature of which was variable, whereas that of melting ſnow was certain and invariable. Thoſe which would not freeze in melting ſnow were afterwards immerſed in a mixture of common ſalt, ſnow, and water; the temperature of which, though not ſo conſtant and determinate as that of melting ſnow, generally remained for ſeveral hours at 18°, and was ſometimes ſeveral degrees lower. The intention of adding water to the ſnow and ſalt was to leſſen the intenſity of the cold of this mixture, and to render it more permanent than if the ſnow and ſalt alone were mixed. The acids which had frozen in melting ſnow were five in number; which being thawed and brought to the temperature of 60°, were found on examination to have the following ſpecific gravities, viz. 1786, 1784, 1780, 1778, 1775. Thoſe which had not congealed with the melting ſnow, but which did ſo with the mixture of ſnow, ſalt, and water, were found, when brought to the temperature of 60°, to be of the following ſpecific gravities, viz. 1814, 1810, 1804, 1794. 1790, 1770, 1759, 1750. Thoſe which remained, and would freeze neither in melting ſnow nor in the mixture of ſnow, ſalt, and water, were of the gravities 1864, 1839, 1815, 1745, 1720, 1700, 1610, 1551. From the firſt of theſe it appears, that the medium denſity of the acids which froze with the natural cold was 1780; and from the ſecond, that at the denſities of 1790 and 1770 the acid had been incapable of freezing with that degree of cold. Hence it follows, that 1780 is nearly the degree of ſtrength of eaſieſt freezing, and that an increaſe or diminution of that denſity equal to $\frac{1}{178}$th of the whole, renders the acid incapable of freezing with the cold of melting ſnow, though this cold is ſomething above the freezing point of the moſt congealable acid. From the ſecond it appears, that by applying a more intenſe cold, viz. that produced by a mixture of ſnow, ſalt, and water, the limits of the denſities of acids capable of congelation were extended to about $\frac{1}{178}$th above or below the point of eaſieſt freezing: and there ſeems little reaſon to doubt, that, by greater augmentations of cold, theſe limits may be further extended; but in what ratio theſe augmentations and extenſions proceed, cannot be determined, without many obſervations made in different temperatures.

"But (ſays Mr Keir) though it is probable that the moſt concentrated acids may be frozen, provided the cold be ſufficiently intenſe, yet there ſeems reaſon to believe, that ſome of the congelations which have been obſerved in highly concentrated acids, have been effected in conſequence of the denſity of theſe acids being reduced nearly to the point of eaſy freezing by their having abſorbed moiſture from the air: for the Duke d'Ayen and M. de Morveau expoſed their acids to the air in cups or open veſſels; and the latter even acquaints us, that on examining the ſpecific gravity of the acid which had frozen, he found it to that of water as 129 to 74; which denſity being leſs than that of eaſieſt freezing, proves that the acid he employed, and which he had previouſly concentrated, had been actually weakened during the experiment. I have ſeveral times expoſed concentrated ſulphuric acid in open veſſels in froſty weather; and I have ſometimes, but not always, obſerved a congelation to take place. Upon ſeparating the congealed part, and on examining the ſpecific gravity of the latter after it had thawed, I found that it had been reduced to the point of eaſieſt freezing. When the congealed acid was kept longer expoſed it gradually thawed, even when the cold of the air increaſed; the reaſon of which is not to be imputed to the heat produced by the moiſture of the air mixing with the acid, but principally to the diminution below the point of eaſieſt freezing, which was occaſioned by the continued abſorption of moiſture from the air, and which rendered the acid incapable of continuing frozen without a great increaſe of cold.

"It appears, then, that the concentration of M. de Morveau's acid, at the time of its congelation, from which circumſtance Mr Cavendiſh infers generally that ſulphuric acid freezes more eaſily as it is more denſe, is not a true premiſe; and that therefore the inference, though juſtly deduced, is invalid. On the contrary, there ſeems every reaſon to believe, that as the denſity of the acids increaſes beyond the point of eaſieſt freezing, the facility of the congelation diminiſhes; at leaſt to as great denſity as we have ever been able to obtain ſulphuric acid: for if it were poſſible to diveſt it entirely of water, it would probably aſſume a ſolid form in any temperature of the air.

"The cryſtallization of ſulphuric acid is more or leſs diſtinct, according to the ſlowneſs of the formation of the cryſtals and other favourable circumſtances. Sometimes they are very large, diſtinctly ſhaped, and hard. Their ſhape is like thoſe of the common mineral alkali and ſelenite ſpar, but with angles different in dimenſions from either of theſe. They are ſolid, conſiſting of ten faces; of which the two largeſt are equal, parallel, and oppoſite to each other; and are oblique-angled parallelograms or rhomboids, whoſe angles are, as near as could be meaſured, of 105 and 75 degrees. Between theſe two rhomboidal faces are placed eight of the form of trapeziums; and thus each cryſtal may be ſuppoſed to be compounded of two equal and ſimilar fruſtums of pyramids joined together by their rhomboidal baſes. They always ſunk in the fluid acid to the bottom of the veſſel, which ſhowed that their denſity was increaſed by congelation. It was attempted to determine their ſpecific gravity by adding to this fluid ſome concentrated acid, which ſhould make them float in the liquor, the examination of whoſe ſpecific gravity ſhould aſcertain that of the floating cryſtals; but they were found to ſink even in the moſt concentrated acid, and were conſequently denſer. Some of the congealable acid previouſly brought to the freezing temperature was then poured into a graduated narrow cylindrical glaſs, up to a certain mark, which indicated a ſpace equal to that occupied by 200 grains of water. The glaſs was placed in a mixture of ſnow, ſalt, and water; and when the acid was frozen, a mark was made on the part of the glaſs to which it had ſunk. Having thawed the acid and emptied the glaſs, it was filled with water to the mark to which it had ſunk by freezing; and it was then found that 15 grains more of water were required to raiſe it to the mark expreſſing 200 grains; which ſhows, that the diminution of bulk ſuſtained by the acid in freezing had been equal to $\frac{1}{13,3}$ of the whole. Computing from this datum, we ſhould eſtimate the ſpecific gravity of the congealed acid to have been 1924; but as it evidently contained a great number of bubbles, its real ſpecific gravity muſt have been conſiderably greater than the above calculation, and cannot eaſily be determined on account of theſe bubbles. By way of compariſon, Mr Keir obſerved the alteration of bulk which water contained in the ſame cylindrical veſſel would ſuffer by freezing; and found that its expanſion was equal to about $\frac{1}{10}$th of its bulk. The water had been previouſly boiled, but nevertheleſs contained a great number of air bubbles; ſo that in this reſpect there is a conſiderable difference between the congelations of water and ſulphuric acid; though perhaps it may ariſe principally from the bubbles of elaſtic fluid being in greater proportion in the one than the other.

"Greater cold is produced by mixing ſnow or pounded ice with the congealed than with the fluid ſulphuric acid, though the quantity is not yet determined. The greateſt cold produced by Mr M'Nab at Hudſon's Bay, was effected by mixing ſnow with a ſulphuric acid which had been previouſly congealed; and to this circumſtance Mr Cavendiſh imputes the intenſity of the cold, as the liquefaction both of the acid and the ſnow had concurred in producing the ſame effect; while in mixing fluid acids with ſnow, the thawing of the ſnow is probably the only productive cauſe.

"To compare the times requiſite for the liquefactions of ice and of congealed ſulphuric acid, two equal and ſimilar glaſſes were filled, one with the congealable ſulphuric acid, the other with water; and after having immerſed them in a freezing mixture, till both were congealed and reduced to the temperature of 28°, the glaſſes were withdrawn, wiped dry, and placed in a room where the thermometer ſtood at 62°. The ice thawed in 40 minutes, and the acid in 95; at the end of which time the thermometer, which ſtood near the glaſſes, had riſen to 64°. Hence it appears that the congealed acid requires more than twice the time for its liquefaction that ice does, though it cannot thence be fairly inferred, that the cold generated by the liquefaction of the ice and of congealed acid are in the above proportions of the times, from the following conſiderations, viz. that as, during the liquefaction of the ice, its temperature remains ſtationary at 32°, and during the liquefaction of the acid, its temperature remains about 44 or 45°, it appears, that the ice being conſiderably colder than the acid, will take the heat from the contiguous air much faſter. By this experiment, however, we know that a conſiderable quantity of cold is generated by the liquefaction of the acid; and hence it appears probable, that in producing cold artificially, by mixing ſnow with acids in very cold temperatures, it would probably be uſeful to employ a ſulphuric acid of the proper denſity for congelation, and to freeze it previouſly to its mixture with ſnow. It muſt not, however, be imagined, that the cold generated by the mixture of theſe two frozen ſubſtances is nearly equal to the ſums of the colds generated by the ſeparate liquefactions of the congealed acid and ice, when ſingly expoſed to a thawing temperature; for the mixture reſulting from the liquefaction, conſiſting of ſulphuric acid and the water of the ſnow, appears from the generation of heat which occurs from the mixture of theſe ingredients in a fluid ſtate, to be ſubject to different laws than thoſe which rule either of the ingredients ſeparately.

"The ſulphuric acid, like water and other fluids, is capable of retaining its fluidity when cooled conſiderably below its freezing point. A phial containing ſome congealable ſulphuric acid being placed in a mixture of ſalt, ſnow, and water, a thermometer was ſoon afterwards immerſed in it while the acid was yet fluid, on which it quickly ſunk from 50 to 29°. On moving the thermometer in the fluid, to make it acquire the exact temperature, the mercury was obſerved ſuddenly to riſe; and on looking at the acid, numberleſs ſmall cryſtals were obſerved floating in it, which had been ſuddenly formed. The degree to which the mercury then roſe was 46½°; and at another time, while the acid was freezing, it ſtood at 45°."

From theſe experiments our author infers, "1. That ſulphuric acid has a point of eaſieſt freezing, and that this is when the ſpecific gravity is to that of water as 1780 to 1000. 2. That the greater or leſs diſpoſition to congelation does not depend on any other circumſtance than the ſtrength of the acid. 3. That the freezing and thawing degree of the moſt congealable acid is about 45° of Fahrenheit's ſcale. It is, however, to be obſerved, that this degree is inferred from the temperature indicated by the thermometers immerſed in the freezing and thawing acids; but the congelation of the fluid acid could never be accompliſhed without expoſing it to a greater degree of cold, either by expoſing it to the air in froſty weather or to the cold of melting ſnow. 4. Like water, this acid poſſeſſes the property of retaining its fluidity when cooled ſeveral degrees below the freezing point; and of riſing ſuddenly to it when its congelation is promoted by agitation, or by contact even with a warmer thermometer. 5. That, like water and other congealable fluids, ſulphuric acid generates cold by its liquefaction, and heat during its congelation, though the quantity of this heat and cold remains to be determined by future experiments. 6. That the acid, by congelation, when the circumſtances for diſtinct cryſtallization are favourable, aſſumes a regular cryſtalline form, a conſiderable ſolidity and hardneſs, and a denſity much greater than it poſſeſſed in its fluid ſtate."

Beſides this ſpecies of congelation, ſulphuric acid is ſubject to another, probably the ſame deſcribed by Baſil Valentine and ſome of the older chemiſts. This is effected in the ordinary temperature of the air, even in ſummer; and, according to Mr Keir *, is peculiar to that ſpecies of ſulphuric acid which is diſtilled from green vitriol, and which is poſſeſſed of a ſmoking quality in a high degree; "for not only the authors (ſays Mr Keir) by whom this congelation has been obſerved, have given this deſcription of the acid employed, but alſo the late experiments of Mr Dolfuſs, ſeem to ſhow that this ſmoking quality is eſſential to the phenomenon: for neither the acid obtained from vitriol, when deprived by rectification of its ſmoking quality, nor the Engliſh ſulphuric acid, which is known to be obtained by burning ſulphur, and which does not ſmoke, were found by his trials to be ſuſceptible of this ſpecies of congelation. It may, however, be worth the attention of thoſe chemiſts who have an opportunity of ſeeing this *icy ſulphuric acid*, as it is called, to obſerve more accurately than has yet been done, the freezing temperature and the denſity of the congealable acids; and to examine whether the denſity of this ſmoking acid alſo is connected with the glacial property. It ſeems alſo further deſerving of inveſtigation, whether there be not ſome analogy between the congelation of the ſmoking ſulphuric acid and the very curious cryſtallization which Dr Prieſtley obſerved in a concentrated ſulphuric acid ſaturated with nitrous acid vapours; and whether this ſmoking quality does not proceed from ſome marine or other volatile acid, which may be contained in the martial vitriol whence the ſulphuric acid is obtained."

Mr Keir alſo obſerves, that M. Cornatter has effected the cryſtallization of ſulphuric acid, by diſtilling it with nitrous acid and charcoal; and we can add from our own experience, that a cryſtallization inſtantly takes place on allowing the fumes of the nitrous and ſulphuric acids to mix together; and this, whether the former be procured from martial vitriol or ſulphur, and whether it be in a phlogiſticated ſtate or not, concentration in both acids is here the only requiſite.

CONGER, in *Zoology*. See MURÆNA, ICHTHYOLOGY *Index*.

CONGERIES, a Latin word, ſometimes uſed in our language for a collection or heap of ſeveral particles of bodies united into one maſs or aggregate.

CONGESTION, in *Medicine*, a maſs or collection of humours, crowded together and hardened in any part of the body, and there forming a preternatural tumour.

Congeſtion is effected by little and little; in which it differs from *defluction*, which is more ſudden.

CONGIARIUM,

* *Phil. Tranſ.* vol. lxxvii. p. 267.

CONGIARIUM, CONGIARY, among medaliſts, a gift or donative repreſented on a medal. The word comes from the Latin *congius;* becauſe the firſt preſents made to the people of Rome conſiſted in wine and oil, which were meaſured out to them in *congii*. The congiary was properly a preſent made by the emperors to the people of Rome. Thoſe made to the ſoldiers were not called *congiaries*, but *donatives*. The legend on medals repreſenting *congiaries*, is, *Congiarium* or *Liberalitas*. Tiberius gave a congiary of three hundred pieces of money to each citizen: Caligula twice gave three hundred ſeſterces a head: Nero, whoſe congiaries are the firſt that we find repreſented on medals, gave four hundred.

CONGIUS, a liquid meaſure of the ancient Romans, containing the eighth part of the amphora, or the fourth of the urna, or ſix ſextarii. The congius in Engliſh meaſure contains 2,070,676 ſolid inches; that is, ſeven pints, 4,942 ſolid inches.

CONGLOBATE GLAND. See ANATOMY *Index*.

CONGLOMERATE GLAND. See ANATOMY *Index*.

Conglomerate Flowers, are thoſe growing on a branching foot-ſtalk, to which they are irregularly but cloſely connected. This mode of infloreſcence, as Linnæus terms it, is oppoſed to that in which the flowers are irregularly and looſely ſupported on their foot-ſtalks, hence termed a *diffuſe panicle* *. The term is exemplified in ſeveral of the graſſes, particularly in ſome ſpecies of the *poa*, feſcue graſs, and agroſtis.

* See *Panicle*.

CONGLUTINATION, the glueing or faſtening any two bodies together by the intromiſſion of a third, whoſe parts are unctuous and tenacious, in the nature of glue. See GLUE.

1 Extent.

CONGO, a kingdom of Africa, bounded on the north by the river Zair, or Zarah, which divides it from Loanga; on the ſouth by the river Danda, which ſeparates it from Angola; on the eaſt by the kingdoms of Fungono and Metamba, and the burnt mountains of the ſun, thoſe of cryſtal or ſalt-petre, and ſilver, or (according to Anthony Cavazzi, a traveller into thoſe parts) by the mountains of Coanza, Berbela, and the great mountains of Chilandria or Aquilonda; and on the weſt by that part of the Atlantic ocean called the *Ethiopic ſea*, or the *ſea of Congo*. According to theſe limits, Congo Proper extends about three degrees from north to ſouth; lying between the line and 18° S. Lat.; but widens in its breadth inland, by the courſe of the river Zair, which runs winding above two degrees more to the north. Its length from eaſt to weſt is very uncertain, as no obſervations have been taken of the exact ſituation of thoſe mountains which bound it.

2 Hiſtory uncertain and fabulous.

The hiſtory of this kingdom affords but few intereſting particulars. Before its diſcovery by the Portugueſe, the hiſtory is altogether uncertain and fabulous, as the inhabitants were totally unacquainted with letters and learning. So little were they acquainted with chronology, that it is ſaid they did not even diſtinguiſh between day and night; much leſs could they compute their time by moons or years; and therefore could remember paſt tranſactions only by ſaying they happened in ſuch a king's reign.

3 The country diſcovered by the Portugueſe.

The country was diſcovered by the Portugueſe in 1484. The diſcoverer was named *Diego Cam*, an expert and bold ſoldier. He was very well received by the natives, and ſent ſome of his men with preſents to the king; but they being detained by unexpected accidents beyond the promiſed time of their return, Cam was obliged to ſail away without them, and took with him four young Congoeſe, as hoſtages for the ſafety of his countrymen. Theſe he taught the Portugueſe language, in which they made ſuch progreſs that King John was highly pleaſed, and ſent them back next year to Congo with rich preſents; charging them to exhort their monarch, in his name, to become a convert to the Chriſtian religion, and to permit it to be propagated through his dominions. A firm alliance was concluded between the two monarchs, which continues to this day, though not without ſome interruptions, to which the Portugueſe themſelves have given occaſion more than the natives.

4 Cavazzi's account of Congo.

Any particular account we have of this kingdom, reſts almoſt entirely on the credit of Anthony Cavazzi, the traveller above mentioned. He was a capuchin friar, a native of the duchy of Modena, and was ſent miſſionary into thoſe parts *de propaganda fide*, in the year 1654, and arrived at Congo the ſame year. During his ſtay there, his zeal to make converts made him travel through all theſe different kingdoms; and the credit he gained, as well as the great employments he was entruſted with, gave him an opportunity of informing himſelf of every thing relating to them with great exactneſs. The extent and ſituation, however, he could not poſſibly aſcertain, for want of inſtruments; nor hath this defect been ſince ſupplied.

5 Extent leſſened ſince the introduction of Chriſtianity.

According to him the dominions of Congo extended a great deal further eaſtward and ſouthwards before the introduction of Chriſtianity than afterwards; a great number of the ſtates that were under the Congoeſe monarchs, either as ſubjects, or tributary, having withdrawn their allegiance out of diſlike to them on that account. Not content with oppoſing the officers and troops that came annually to raiſe the tribute impoſed by the king, they made ſuch frequent and powerful incurſions into his dominions, that they obliged him to draw his forces nearer the centre of Congo to prevent an invaſion; by which means the kingdom, from an extent of 600 leagues, was reduced to leſs than one half.

6 Account of the climate and ſeaſons.

Congo Proper being ſituated within the torrid zone, is liable to exceſſive heats: as it lies on the ſouthern ſide of the equinoctial, the ſeaſons are of courſe oppoſite to ours. They reckon only two principal ſeaſons, the ſummer and winter; the former begins in October, and continues till February or March; during which time the ſun's rays dart with ſuch force, that the atmoſphere appears to an European to be in a flame. The exceſſive heat, however, is mitigated by the equal length of the days and nights, as well as by the winds, breezes, rains, and dews. The winter takes up the other part of the year; and is ſaid by the natives to be proportionally cold, though to an European it would appear hot. Theſe two ſeaſons they divide into ſix leſſer ones, viz. Maſſanza, Neaſu, Ecundi, Quitombo, Quibiſo, and Quibangala.

Maſſanza begins with the month of October, which is the beginning of their ſpring. The rains begin to fall at that time, and continue during the next two, and ſometimes three, months. When this happens, the low lands are commonly overflowed with extraordinary floods, and all their corn carried off. A diſaſter of this kind is commonly followed by a famine; for the lazy inhabitants take no care to lay up any proviſions, although ſuch misfortunes happen very frequently. This firſt ſeaſon they reckon commences at the time the plants begin to ſpring.

The ſecond ſeaſon, Neaſu, begins about the end of January, when the produce of their lands has arrived at its full height, and wants but a few days of being ripened for harveſt. This firſt crop is no ſooner gathered in, than they ſow their fields afreſh, their land commonly yielding them two harveſts.

The third and fourth ſeaſons, called *Ecundi* and *Quitombo*, are frequently blended together towards the middle of March, when the more gentle rains begin to fall, and continue till the month of May. Theſe two ſeaſons are diſtinguiſhed by the greater or leſſer quantity of rain that falls during that interval. During the reſt of the time, the air is either very clear, hot, and dry; or the clouds being overcharged with electric matter, burſt out into the moſt terrible thunders and lightnings, without yielding the leaſt drop of rain, though they ſeem loaded with it.

The two laſt, viz. the Quibiſo and Quibangala, make up their ſhort winter, which conſiſts not in froſt or ſnow, but in dry, blaſting winds, which ſtrip the earth of all its verdure, till the next Maſſanza begins to reſtore them to their former bloom.

7
Natives exceſſively indolent.

They now divide their year into twelve lunar months, and begin it in September. They have alſo weeks conſiſting of four days only, the laſt of which is their ſabbath; and on it they religiouſly abſtain from every kind of work. This practice, the compilers of the Univerſal Hiſtory conjecture to have ariſen from the extreme lazineſs for which this people, and indeed all the African nations, are ſo remarkable. To this ſhameful indolence alſo is to be aſcribed the little produce they reap from their lands, while the Portugueſe ſettled among them, who are at more pains in the cultivation of theirs, enjoy all manner of plenty. The natives, however, had rather run the riſk of the moſt terrible famines, than be at the tenth part of the labour they ſee the Portugueſe take. They ſeem to think it below them to uſe any other exerciſes than thoſe of dancing, leaping, hunting, ſhooting, &c.; the reſt of their time they ſpend in ſmoking, and downright idleneſs, committing the laborious part of their houſehold affairs to their ſlaves, or, in want of them, to their wives. Nothing is more common than to ſee theſe poor creatures toiling in the fields and woods with a child tied to their backs, and fainting under their exceſſive labour and heavy burdens, or (which is ſtill worſe) hunger and thirſt. What is yet more ſurpriſingly ſhameful is, that though they have plenty of domeſtic animals which they might eaſily make uſe of for cultivating their grounds, and for other laborious ſervices, and though they ſee the Portugueſe do it every day to great advantage; yet they will rather ſee their tender females ſink under their toil and labour, than be at the trouble of breeding up any of theſe uſeful creatures to their aſſiſtance.

8
Vegetables produced in Congo.

The ground produces variety of grain, but no corn or rice except what is cultivated by the Portugueſe. Their maize, or Indian wheat, grows very ſtrong, and is well laden. This being well ground, they make into bread, or boil with water into a kind of pap. Of this they have four kinds; one of which, reſembling what we call French wheat, is produced in plenty, and makes ſome amends for the want of induſtry in the people. They cultivate alſo a variety of the peaſe and bean kind: but what they chiefly live upon, as moſt ſuitable to their lazy diſpoſition, is a kind of nut, like our filberts, which fall to the ground of themſelves, and are to be found everywhere; every nut that falls to the ground producing a new ſhrub next year. They have ſcarcely any fruit-trees but what have been brought hither by the Portugueſe. They have various ſorts of palm-trees, uſeful both by their fruit, leaves, and their juice, which is eaſily converted into wine; alſo by affording a kind of oil with which they dreſs their victuals, though the Europeans uſe it only to burn in their lamps. They have alſo a vaſt number of plants and ſhrubs, which it would be impoſſible to deſcribe or enumerate. Wheat is the only thing that the ground will not produce. It puſhes forth, indeed, the ſtraw and the ear; the former of which grows high enough, we are told, to hide a man on horſeback, but the latter is empty, without one grain fit for uſe. Father Labat, however, who had lived a conſiderable time in ſome of the American iſlands, where he had obſerved the ſame thing, tells us, that he had the curioſity to examine thoſe ears more carefully, and had found ſome few grains; and that, having ſowed them afreſh, they produced very long ears full of large heavy grain. Whence he conjectures, that if the Portugueſe had tried the ſame experiment in their African ſettlements, it might perhaps have been attended with the ſame ſucceſs.

9
Hazardous travelling.

In the low lands the graſs grows ſo high, rank, and thick, that it becomes one of the moſt dangerous receptacles for wild beaſts, ſerpents, and other venomous inſects: on this account travelling is exceedingly hazardous, as there are few beaten roads in the whole country, and travellers are obliged to march over it, through vaſt plains, in continual danger of being devoured or ſtung to death; to ſay nothing of the manifold diſeaſes produced by the unwholeſome dews with which the graſs is covered during ſome part of the day. The only method of guarding againſt all theſe evils effectually, is by ſetting fire to the graſs in the hot weather, when it is quite parched by the heat of the ſun: but even this cannot be done without the greateſt danger; becauſe both the wild beaſts and venomous reptiles, being rouſed out of their places of retirement, will fly furiouſly at thoſe who happen to be in the way. In this caſe there is no poſſibility of eſcaping; but by climbing up the higheſt trees, or defending one's ſelf with fire-arms or other weapons. In ſuch emergencies, the natives have a much better chance than the Europeans; the former being able to climb trees with ſurpriſing ſwiftneſs; while the latter muſt be aſſiſted with rope-ladders, which they commonly cauſe their blacks to carry about with them, and to go up and faſten to one of the branches.

10
Great variety of flowers.

The flowers are here exceedingly beautiful and numerous. Almoſt every field and grove yields a much nobler proſpect than the European gardens can boaſt of, notwithſtanding the pains beſtowed on their cultivation. The flowers are remarkable, not only for the prodigious variety of their colours, but the vaſt quantity of heads which grow upon one ſtalk. In the day-time, indeed, they ſeem to have loſt their natural fragrancy; that being in ſome meaſure exhaled by the heat of the ſun: but this is amply compenſated after its ſetting, and more eſpecially a little before its riſing, when their ſweetneſs is again condenſed, and revived by the coldneſs and dews of the night, after which they exhale their various refreſhing ſcents in a much higher degree than ours. The lilies, which there grow naturally in the fields, valleys, and woods, excel thoſe of our gardens, not only in their extreme whiteneſs, but much more in a delightful fragrancy, without offending the head, as the European lilies do by their faintiſh ſweetneſs. The tulips which there grow wild, though generally called *Perſic*, have ſomething ſo ſurpriſingly charming in the variety and combination of their colours, that they dazzle the eyes of an intenſe beholder: neither do their flowers grow ſingly as with us, but ten or twelve upon one ſtalk; and with this double advantage, that they diffuſe a very reviving and agreeable ſweetneſs, and continue much longer in their full bloom. Of the ſame nature are their tuberoſes, hyacinths, and other native flowers; which ſpring up in vaſt groups of 100 and 200 from one root, though ſomewhat ſmaller than ours; ſome of them finely variegated, and all of them yielding an agreeable ſmell. The roſes, jeſſamines, and other exotics brought hither from Europe or America, come up likewiſe in great perfection, but require a conſtant ſupply of water, and diligent attendance, to prevent them from degenerating. The American jeſſamine, in particular, inſtead of ſingle flowers, will grow up by dozens in a bunch; ſome of them of an exquiſite white, and others of the colour of the moſt vivid fire.

11
Animals of different kinds.

A vaſt variety of animals of different kinds are found in the kingdom of Congo; the chief of which is the elephant. This creature is moſtly found in the province of Bamba, which abounds with woods, paſture, and plenty of water; the elephants delighting much to bathe themſelves during the heat of the day. They commonly go in troops of an hundred or more; and ſome of them are of ſuch a monſtrous ſize, that we are told the print of their hoof hath meaſured four, nay ſeven, ſpans in diameter. From the hair of their tails, and that of ſome other animals, the natives, eſpecially the women, weave themſelves collars, bracelets, girdles, &c. with variety of devices and figures, which denote their quality; and are in ſuch eſteem, that the hair of two elephants tails is ſufficient to buy a ſlave. The reaſon of this is, that the natives have not the art of taming them, but are obliged to ſend ſome of the braveſt and ſtouteſt men to hunt them in the woods; which is not done without great labour and danger, they being here exceedingly fierce. The moſt common way of hunting them is by digging deep holes in the ground, the top of which they cover with branches and leaves, as is practiſed in moſt parts of Aſia.

Lions, leopards, tigers, wolves, and other beaſts of prey, abound here in great plenty, and do much damage. Here are alſo a vaſt variety of monkeys of all ſizes and ſhapes. The zebra, well known for its extreme beauty and ſwiftneſs, is alſo met with in this country. They have alſo a variety of buffaloes and wild aſſes; but the *dante* ſeems to be an animal peculiar to this kingdom. It is ſhaped and coloured much like an ox, though not ſo large. Its ſkin is commonly bought by the Portugueſe, and ſent into Germany to be tanned and made into targets, which are then called *dantes*. The natives make uſe of their raw hides dried to make their ſhields; which are ſo tough that no arrow or dart can pierce them; and they are alſo large enough to cover the whole body. The creature is vaſtly ſwift; and when wounded, will follow the ſcent or ſmoke of the gunpowder with ſuch fury, that the hunter is obliged to climb up a tree with all poſſible ſpeed; and this retreat he always takes care to ſecure before he ventures to fire. The wounded beaſt finding its enemy out of its reach, ſtays for him at the foot of the tree, and will not ſtir from it; of which the hunter taking the advantage, diſpatches it with repeated ſhots. The foreſts of Congo alſo ſwarm with wild dogs, who, like the wolves, prey upon the tame cattle, and are ſo fierce that they will attack armed men. Their teeth are exceeding keen and ſharp; they never bark, but make a dreadful howling when famiſhed or in purſuit of their prey.

12
Birds.

This country alſo abounds with all the different kinds of birds that are to be found in other warm climates. One ſort, which they call *birds of muſic*, is greatly eſteemed, inſomuch that perſons of the higheſt rank have from time immemorial taken the greateſt delight in keeping them in cages and aviaries for the ſake of their ſurpriſing melody. On the other hand, as the Congoeſe are ſuperſtitious to the laſt degree, there are ſeveral kinds of birds which they look upon as ominous, and are ſo terrified at the ſight or hearing of them, that if they were going to enter upon ever ſo momentous an expedition, if they were met in council, or going to engage an enemy with ever ſo great an advantage, the flight or cry of ſuch birds would throw them into a general panic, and diſperſe them in the utmoſt haſte and confuſion. The moſt dreadful of the ominous kind are the crows, ravens, bats, and owls. The great owl is the moſt terrible of all, and to him they give the name of *kariam pemba*, by which words they likewiſe denote the devil.

13
Ants very dangerous.

Fiſh of different kinds abound on the coaſts of Congo in great numbers; but the inland parts are infeſted with ſuch numbers of ſerpents, ſcorpions, and other venomous inſects, as are perhaps ſufficient to overbalance every natural advantage we have yet mentioned. The moſt pernicious and dangerous kind are the ants; of which they reckon no leſs than ſix ſeveral ſpecies of different colours and ſizes; all of them formidable on account of their prodigious numbers, and the miſchief they do not only to the fruits of the earth, but to men and beaſts; whom they will ſurround in the night-time, and devour even to the very bone. It is a common practice, we are told, to condemn perſons guilty of ſome atrocious crimes to be ſtripped naked, tied hand and foot, and thrown into a hole where theſe inſects ſwarm; where they are ſure to be devoured by them in leſs than 24 hours to the very bones. But criminals are not the only perſons who are in danger from the jaws of theſe little devouring inſects. People may be attacked by them, as we have already hinted, in the night-time, and while they are ſleeping in their beds. This obliges the natives to be careful where they lie down, and to kindle a ſmall fire, or at leaſt to have a circle of burning hot embers round their beds. This caution is ſtill more neceſſary in the country villages and hamlets, where perſons are otherwiſe in danger of being attacked by millions of them in the dead of the night. In ſuch a caſe the only expedient to ſave one's ſelf is to jump up as ſoon as one feels the bite, to bruſh them off with all poſſible ſpeed, and then at once to ſet the houſe on fire. The danger is ſtill greater in travelling through the country, where a perſon is often obliged to take up his lodging on the bare ground; and may be overtaken during the heat of the day with ſuch profound ſleep, as not to be awakened by theſe diminutive animals till they have made their way through the ſkin; and in ſuch a caſe nothing will prevent their devouring a man alive, though there were ever ſo many hands to aſſiſt him: in ſuch incredible quantities do theſe creatures abound, notwithſtanding the great numbers of monkeys who are continually ferreting the ants out of their retreats, and feed upon them with the utmoſt avidity. This can only be aſcribed to the natural lazineſs and indolence of the inhabitants; which is ſuch, that they not only neglect to rid their land of them by proper cultivation, but will ſuffer their houſes, nay, even their very churches, to be undermined by them. Another kind of theſe deſtructive vermin lie ſo thick upon the paths and highways, that a perſon cannot walk without treading upon, and having his legs and thighs almoſt devoured by them. A third ſort of a white and red colour, but very ſmall, will gnaw their way through the hardeſt wood, penetrate into a ſtrong cheſt, and in a little while devour all the clothes, linen, and every thing that is in it. A fourth ſort, ſmall and black, leave a moſt intolerable ſtench upon every thing they touch or crawl over, whether clothes or houſehold-ſtuff, which are not eaſily ſweetened again; or if they paſs over victuals, they are entirely ſpoiled. A fifth ſort harbour chiefly on the leaves and branches of trees; and if a man chance to climb up thither to ſave himſelf from a wild beaſt, he is ſo tormented by them, that nothing but the fear of the jaws of the one could make him endure the ſtings of the other. A ſixth ſort is of the flying kind; and is probably one of the former kinds, that live wholly under ground, till nature furniſhes them with wings. After this, they riſe in ſuch ſwarms as darken the air, and would make terrible havock among all kinds of vegetables, did not the natives come out againſt them in whole companies, and by dint of flaps, and other flat weapons, knock them down by myriads, and then laying them in heaps, ſet fire to their wings, which half broils them for food. Amidſt all this variety of pernicious inſects, however, they have one ſpecies of a more friendly and profitable kind, viz. the induſtrious bee, which furniſhes the inhabitants with honey and wax in ſuch plenty, that there is ſcarce a hollow tree, cleft of a rock, or chop of the earth, in which their combs are not found in great quantities.

14
Congo very populous.

With reſpect to the populouſneſs of the kingdom of Congo, ſome authors, writing either from mere conjecture, or at beſt precarious inferences, have repreſented it as thinly peopled. The accounts of the miſſionaries and Portugueſe, however, are directly oppoſite to theſe. They found the country for the moſt part covered with towns and villages, and theſe ſwarming with inhabitants; the cities well filled with people, particularly the metropolis, which is ſaid to contain above 50,000 ſouls. The provinces, though not equally populous, yet in the whole make up ſuch an amount as plainly proves, that what is wanting in the one is amply made up by the other. We are told that the duchy of Bamba is ſtill able to raiſe 200,000 fighting men, and was formerly in a condition to raiſe double that number; and that the army of the king of Congo, in the year 1665, conſiſted of 900,000 fighting men, who were attended by an infinite number of women, children, and ſlaves. The numbers of the Congoeſe will appear the more credible, when we conſider the extreme fecundity of their women, the hardineſs with which they bring up their children, and the ſtoutneſs and healthineſs of their men. In ſome villages, if the miſſionaries are to be credited, the number of children is ſo great, that a father will part with one or two, for any commodity he wants, or even for ſome trifling bauble he fancies; ſo that the number of ſlaves they ſell abroad ſeldom amounts, *communibus annis*, to leſs than 15,000 or 16,000.

15
Congoeſe have a high opinion of themſelves.

There is ſcarcely a nation on earth that have a higher opinion of themſelves or their country than the Congoeſe, or that is more hardened againſt all conviction to the contrary, from reaſon, experience, or the moſt impartial compariſon with other countries in Europe or Aſia. Indeed it is impoſſible they ſhould think otherwiſe, when it is one of the fundamentals of their belief, that the reſt of the world was the work of angels, but that the kingdom of Congo, in its full and ancient extent, was the handywork of the Supreme Architect; and muſt of courſe have vaſt prerogatives and advantages over all others. When told of the magnificence of the European and Aſiatic courts, their immenſe revenues, the grandeur of their palaces and edifices, the richneſs and happineſs of their ſubjects, the great progreſs they have made in the arts and ſciences to which their county is wholly a ſtranger, they coolly anſwer, that all this comes vaſtly ſhort of the dignity and ſplendor of the kings and kingdom of Congo; and that there can be but one Congo in the world, to the happineſs of whoſe monarch and people all the reſt were created to contribute, and to whoſe treaſury the ſea and rivers pay their conſtant tribute of zimbis (or ſhells, which are their courent coin); whilſt other princes muſt condeſcend to enrich themſelves by digging through rocks and mountains, to come at the excrements of the earth, ſo they ſtyle gold and ſilver which are in ſuch requeſt among other nations. Accordingly, they imagine, that the nations which come to traffic with them, are forced to that ſervile employment by their poverty and the badneſs of their country, rather than induced to it by luxury or avarice; whilſt they themſelves can indulge their natural indolence or ſloth, though attended with the moſt pinching poverty, rather than diſgrace the dignity of their blood by the leaſt effort of induſtry, which, how laudable and beneficial ſoever, is looked upon by them as only a leſſer degree of ſlavery. But though they generally eſteem it ſo much below their dignity to apply to any

16
Their ſloth, pride, &c.

uſeful work, they think it no diſgrace to beg or ſteal. With reſpect to the firſt, they are ſaid to be the moſt ſhameleſs and importunate beggars in the world. They will take no denial, ſpare no crouching, lying, prayers, to obtain what they want, nor curſes and ill language when ſent away without it. With regard to the laſt, they deem no theft unlawful or ſcandalous, except it be committed in a private manner, without the knowledge of the perſon wronged. It is eſteemed a piece of bravery and gallantry to wrench any thing from another by violence; and this kind of theft is ſo common, not only among the vulgar, but alſo among the great ones, that they make no ſcruple, in their travels from place to place, to ſeize not only upon all the proviſions they meet with in towns and villages, but upon every thing elſe that falls in their way. Theſe violences oblige the poor people to conceal the few valuables they have, in ſome ſecret place out of the knowledge and reach of thoſe harpies; and they think themſelves well off if they can eſcape a ſevere baſtinading, or other cruel uſage, frequently inflicted upon them, in order to make them diſcover the place of their concealment.

17
Complexion, character, cuſtoms, &c.

The complexion of the natives, both men and women, is black, though not in the ſame degree; ſome being of a much deeper black than others. Their hair is black and finely curled; ſome have it alſo of a dark ſandy colour: their eyes are moſtly of a fine lively black; but ſome are of a dark ſea-colour. They have neither flat noſes nor thick lips like the Nubians and other negroes. Their ſtature is moſtly of the middle ſize; and, excepting their black complexion, they much reſemble the Portugueſe. In their temper they are miſtruſtful, envious, jealous, and treacherous; and where they once take a diſtaſte or affront, will ſpare no pains, and ſtick at no means, however baſe, to be avenged of, and cruſh their enemy under their feet. There is no ſuch thing among them as natural affection. A huſband, if a Heathen, may take as many wives as he pleaſes; and if a Chriſtian, may have any number of concubines, whom he may divorce at pleaſure, or even ſell them though with child. So little regard have they for their children, that there is ſcarce one among them who will not ſell a ſon or a daughter, or perhaps both, for a piece of cloth, a collar or girdle of coral or beads, and often for a bottle of wine or brandy.

18
Religion.

The religion of the Congoeſe in many parts is downright idolatry, accompanied with the moſt ridiculous ſuperſtitions, and the moſt abſurd and deteſtable rites invented by their gangas or prieſts; and even in thoſe parts where Chriſtianity is profeſſed, it is ſo darkened by ſuperſtitions of one kind or other, that we may juſtly queſtion whether the people are any gainers by the exchange.

19
Government.

The government of this kingdom is monarchical, and as deſpotic as any in Aſia or Africa. The kings are the ſole proprietors of all the lands within their dominions; and theſe they can diſpoſe of to whom they pleaſe, upon condition they pay a certain tribute out of them: upon failure of the payment of which, or any other neglect, they turn them out. Even the princes of the blood are ſubjected to the ſame law; ſo that there is no perſon of any rank or quality whatever that can bequeath a foot of land to his heirs or ſucceſſors; and when theſe owners under the crown die, the lands immediately return to it again, whether they were in their poſſeſſion, or had been left to ever ſo many tenants under them; ſo that it entirely depends on the prince whether theſe lands ſhall be continued in the ſame, or be diſpoſed into other hands. The Portugueſe, however, ſince their ſettling in theſe parts, have prevailed upon the monarchs to permit the heirs and ſucceſſors to continue in the quiet poſſeſſion of ſuch lands, in order to avoid the confuſions, or even rebellions, which the alienation and deprival of them frequently occaſioned, and to oblige the tenants of them to pay their tribute more exactly and readily than they did before.

20
Commerce.

St Salvador is the chief place of trade in this country belonging to the Portugueſe and other Europeans. There are thought to be about 4000 of them ſettled here, who trade with moſt parts of the kingdom. The chief commodities they bring hither are either the product of Brazil or European manufactures. The former conſiſt chiefly of grains, fruits, plants, &c.; the latter of Turkey carpets, Engliſh cloth, and other ſtuffs; copper, braſs veſſels, ſome kinds of blue earthen ware, rings, and ornaments of gold, ſilver, and other baſer metals; coral, glaſs-beads, bugles, and other trinkets; light ſtuffs made of cotton, woollen, and linen, for clothing; and a great variety of tools and other utenſils. In return for theſe they carry off a great number of ſlaves, amounting to 15,000 or 16,000 annually, as we have already obſerved. Formerly they uſed alſo to carry away elephants teeth, furs, and other commodities of the country; but theſe branches of commerce are now greatly decayed, and the ſlave-trade is what the Portugueſe merchants principally depend on.

Congo, a term applied to tea of the ſecond quality.

CONGREGATION, an aſſembly of ſeveral eccleſiaſtics, united ſo as to conſtitute a body.

The term is principally uſed for aſſemblies of cardinals appointed by the pope, and diſtributed into ſeveral chambers, for the diſcharge of certain functions and juriſdictions, after the manner of our offices and courts. The firſt is the congregation of the holy office, or the inquiſition: the ſecond, that of juriſdiction over biſhops and regulars; the third, that of councils; this has power to interpret the council of Trent: the fourth, that of cuſtoms, ceremonies, precedencies, canonizations, called *the congregation of rites*: the fifth, that of St Peter's fabric, which takes cognizance of all cauſes relating to piety and charity, part whereof is due to the church of St Peter: the ſixth, that of waters, rivers, roads: the ſeventh, of fountains and ſtreets: the eighth, that of the index, which examines the books to be printed or corrected: the ninth, that of the council of ſtate, for the management of the territories belonging to the pope and church (ſee Camerlingo): the tenth, *de bono regimine*; of which two laſt the cardinal-nephew is chief: the eleventh, that of money: the twelfth, that of biſhops, wherein thoſe who are to be promoted to biſhoprics in Italy are examined; this is held before the pope: the thirteenth, that of conſiſtorial matters; the chief whereof is the cardinal-dean: the fourteenth, a congregation for propagating the faith (ſee College): and the fifteenth, that of eccleſiaſtical immunity, for ſettling ſuits againſt churchmen. There is alſo a congregation

tion of alms, which takes care of every thing that relates to the ſubſiſtence of Rome and the ſtate of the church.

CONGREGATION is alſo uſed for a company or ſociety of religious cantoned out of this or that order; and making, as it were, an inferior order, or a ſubdiviſion of the order itſelf. Such are the congregations of the oratory, and thoſe of Cluny, &c. among the Benedictines.

The word is alſo uſed for aſſemblies of pious perſons in manner of fraternities, frequent among the Jeſuits, in honour of the Virgin, &c. It is likewiſe applied to the audience in a church, particularly as conſiſting of the inhabitants of the ſame pariſh.

CONGREGATIONALISTS, in church-hiſtory, a ſect of Proteſtants who reject all church-government, except that of a ſingle congregation under the direction of one paſtor.

CONGRESS, in political affairs, an aſſembly of commiſſioners, envoys, deputies, &c. from ſeveral courts meeting to concert matters for their common good.

CONGRESS, in America, is the aſſembly of delegates from the United States. See AMERICA.

CONGRESS, in a judicial ſenſe, the trial made by appointment of a judge before ſurgeons and matrons, in order to prove whether or not a man be impotent, before ſentence is paſſed for the diſſolution of a marriage ſolicited upon ſuch a complaint.

Neither the civil nor canon law makes any mention of the trial of virility by congreſs. It had its origin in France from the boldneſs of a young fellow, who, in open court, having been hard preſſed by his wife, demanded the congreſs. The judge, ſurpriſed with the novelty of the demand, found it could not be denied, as being the ſureſt evidence that the caſe could admit of. In time it became a branch in the French juriſprudence, and was authorized by decreets and arrets. It obtained for about 120 years; and was annulled by an arret of parliament in 1677, as being found precarious; ſome having failed under the experiment out of mere modeſty and ſhame, which is found to have the ſame effect with actual impotency.

CONGREVE, WILLIAM, a younger brother of an ancient family in Staffordſhire. His father was employed in the ſtewardſhip of the great eſtate of the earl of Burlington in Ireland, where he reſided many years; and our author was born there in 1672. Mr Congreve entered into the Middle-Temple when he came to England, and began to ſtudy the law; but his bias was toward polite literature and poetry. His firſt performance was a novel entitled, *Incognita*, or *Love and Duty reconciled*. He ſoon after began his comedy of the *Old Bachelor*; which was the amuſement of ſome leiſure hours during a ſlow recovery from a fit of illneſs ſoon after his return to England; yet was in itſelf ſo perfect, that Mr Dryden, on its being ſhown to him, declared he had never in his life ſeen ſuch a firſt play. When brought on the ſtage in 1693, it met with ſuch univerſal approbation, that Mr Congreve, though he was but 19 years old at the time of his writing it, became now conſidered as a prop to the declining ſtage, and a riſing genius in dramatic poetry. The next year be produced the *Double Dealer*; which, for what reaſon is not obvious, did not meet with ſo much ſucceſs as the former. The merit of his firſt play, however had obtained him the favour and patronage of Lord Halifax, and ſome peculiar mark of diſtinction from Queen Mary; on whoſe death, which happened in the cloſe of this year, he wrote a very elegant elegiac paſtoral. In 1695, when Betterton opened the new houſe in Lincoln's-Inn fields, Mr Congreve joining with him, gave him his comedy of *Love for Love*, with which the company opened their campaign, and which met with ſuch ſucceſs, that they immediately offered the author a ſhare in the management of the houſe, on condition of his furniſhing them with one play yearly. This offer he accepted; but whether through indolence, or that correctneſs which he looked upon as neceſſary to his works, his *Mourning Bride* did not come out till 1697, nor his *Way of the World* till two years after that. The indifferent ſucceſs this laſt mentioned play, though an exceeding good one, met with from the public, completed that diſguſt to the theatre, which a long conteſt with Jeremy Collier, who had attacked the immoralities of the Engliſh ſtage, and more eſpecially ſome of his pieces, had begun, and he determined never more to write for the ſtage. However, though he quitted dramatic writing, he did not lay down the pen entirely; but occaſionally wrote many little pieces both in proſe and verſe, all of which ſtand on the records of literary fame. It is very poſſible, however, that he might not ſo ſoon have given way to this diſguſt, had not the eaſineſs of his circumſtances rendered any ſubſervience to the opinions and caprice of the town abſolutely unneceſſary to him. For his abilities having very early in life raiſed him to the acquaintance of the earl of Halifax, who was then the Mecænas of the age; that nobleman, deſirous of raiſing ſo promiſing a genius above the neceſſity of too haſty productions, made him one of the commiſſioners for licenſing hackney-coaches; or, according to Coxeter, a commiſſioner of the wine-licenſe. He ſoon after beſtowed on him a place in the pipe-office; and not long after gave him a poſt in the cuſtoms worth 600l. per annum. In the year 1718, he was appointed ſecretary of Jamaica; ſo that the whole of his income towards the latter part of his life was upwards of 1200l. a-year.

The greateſt part of the laſt 20 years of his life was ſpent in eaſe and retirement; and he either did not, or affected not to give himſelf any trouble about reputation. Yet ſome part of that conduct might proceed from a degree of pride; to which purpoſe, T. Cibber, in his Lives of the Poets, vol. iv. p. 93. relates the following anecdote of him: "When the celebrated Voltaire was in England, he waited upon Mr Congreve, and paſſed ſome compliments upon the merit and reputation of his works. Congreve thanked him; but at the ſame time told that ingenious foreigner, that he did not chooſe to be conſidered as an author, but only as a private gentleman, and in that light expected to be viſited. Voltaire anſwered, that if he had never been any thing but a private gentleman, in all probability he had never been troubled with that viſit." He obſerves, in his own account of the tranſaction, that he was not a little diſguſted with ſo unſeaſonable a piece of vanity.

Towards the cloſe of his life he was much afflicted with the gout; and making a tour to Bath for the benefit of the waters, was unfortunately overturned in his chariot: by which, it is ſuppoſed, he got ſome inward bruiſe, as he ever after complained of a pain in his ſide; and, on his return to London, continued gradually declining in his health, till the 19th of January 1729, when he died, aged 57; and, on the 26th following, was buried in Weſtminſter Abbey, the pall being ſupported by perſons of the firſt diſtinction.

CONGRUITY, a ſuitableneſs or relation of agreement between things.

The terms *congruity* and *propriety* are not applicable to any ſingle object: they imply a plurality, and obviouſly ſignify a particular relation between different objects. Thus we currently ſay, that a decent garb is ſuitable or proper for a judge; modeſt behaviour for a young woman; and a lofty ſtyle for an epic poem: and on the other hand, that it is unſuitable or incongruous to ſee a little woman ſunk in an overgrown farthingale, a coat richly embroidered covering coarſe and dirty linen, a mean ſubject in an elevated ſtyle, an elevated ſubject in a mean ſtyle, a firſt miniſter darning his wife's ſtocking, or a reverend prelate in lawn ſleeves dancing a hornpipe.

The perception we have of this relation, which ſeems peculiar to man, cannot proceed from any other cauſe, but from a *ſenſe* of congruity or propriety; for, ſuppoſing us deſtitute of that ſenſe, the terms would be to us unintelligible.

It is a matter of experience, that congruity or propriety, wherever perceived, is agreeable; and that incongruity, or impropriety, wherever perceived, is diſagreeable. The only difficulty is, to aſcertain what are the particular objects that in conjunction ſuggeſt theſe relations; for there are many objects that do not: the ſea, for example, viewed in conjunction with a picture, or a man viewed in conjunction with a mountain, ſuggeſt not either congruity or incongruity. It ſeems natural to infer, what will be found true by induction, that we never perceive congruity or incongruity but among things that are connected together by ſome relation; ſuch as a man and his actions, a principal and his acceſſories, a ſubject and its ornaments. We are indeed ſo framed by nature, as, among things ſo connected, to require a certain ſuitableneſs or correſpondence, termed *congruity* or *propriety*; and to be diſpleaſed when we find the oppoſite relation of *incongruity* or *impropriety*.

If things connected be the ſubject of congruity, it is reaſonable before hand to expect, that a degree of congruity ſhould be required proportioned to the degree of the connexion. And upon examination we find this to hold in fact: where the relation is intimate, as between a cauſe and its effect, a whole and its parts, we require the ſtricteſt congruity; but where the relation is ſlight, or accidental, as among things jumbled together in the ſame place, we require little or no congruity: the ſtricteſt propriety is required in behaviour and manner of living; becauſe a man is connected with theſe by the relation of cauſe and effect: the relation between an edifice and the ground it ſtands upon, is of the moſt intimate kind: and therefore the ſituation of a great houſe ought to be lofty; its relation to neighbouring hills, rivers, plains, being that of propinquity only, demands but a ſmall ſhare of congruity; among members of the ſame club, the congruity ought to be conſiderable, as well as among things placed for ſhow in the ſame niche: among paſſengers in a ſtage coach, we require very little congruity; and leſs ſtill at a public ſpectacle.

Congruity is ſo nearly allied to beauty, as commonly to be held a ſpecies of it; and yet they differ ſo eſſentially as never to coincide: beauty, like colour, is placed upon a ſingle ſubject; congruity upon a plurality: further, a thing beautiful in itſelf, may, with relation to other things, produce the ſtrongeſt ſenſe of incongruity.

Congruity and propriety are commonly reckoned ſynonymous terms; but they are diſtinguiſhable, and the preciſe meaning of each muſt be aſcertained. Congruity is the genus of which propriety is a ſpecies; for we call nothing *propriety*, but that congruity or ſuitableneſs which ought to ſubſiſt between ſenſible beings and their thoughts, words, and actions.

In order to give a full view of theſe ſecondary relations, we ſhall trace them through ſome of the moſt conſiderable primary relations. The relation of a part to the whole, being extremely intimate, demands the utmoſt degree of congruity; even the ſlighteſt deviation is diſguſtful.

Examples of congruity and incongruity are furniſhed in plenty by the relation between a ſubject and its ornaments. A literary performance intended merely for amuſement, is ſuſceptible of much ornament, as well as a muſic-room or a play-houſe; for in gaiety, the mind hath a peculiar reliſh for ſhow and decoration. The moſt gorgeous apparel, however improper in tragedy, is not unſuitable to opera-actors; the truth is, an opera, in its preſent form, is a mighty fine thing; but as it deviates from nature in its capital circumſtances, we look not for nature or propriety in thoſe which are acceſſory. On the other hand, a ſerious and important ſubject admits not much ornament: nor a ſubject that of itſelf is extremely beautiful: and a ſubject that fills the mind with its loftineſs and grandeur, appears beſt in a dreſs altogether plain.

To a perſon of a mean appearance, gorgeous apparel is unſuitable; which, beſides the incongruity, has a bad effect; for by contraſt it ſhows the meanneſs of appearance in the ſtrongeſt light. Sweetneſs of look and manner requires ſimplicity of dreſs, joined with the greateſt elegance. A ſtately and majeſtic air requires ſumptuous apparel, which ought not to be gaudy, nor crowded with little ornaments. A woman of conſummate beauty can bear to be highly adorned, and yet ſhows beſt in a plain dreſs:

> ————————For lovelineſs
> Needs not the foreign aid of ornament,
> But is when unadorn'd, adorn'd the moſt.
>
> *Thomſon's Autumn*, 208.

Congruity regulates not only the quantity of ornament, but alſo the kind. The ornaments that embelliſh a dancing room ought to be all of them gay. No picture is proper for a church but what has religion for its ſubject. All the ornaments upon a ſhield ought to relate to war; and Virgil, with great judgment, confines the carvings upon the ſhield of Æneas to the military hiſtory of the Romans: but this beauty is overlooked by Homer; for the bulk of the ſculpture upon the ſhield of Achilles, is of the arts of peace in general, and of joy and feſtivity in particular: the author of Telemachus betrays the ſame inattention, in deſcribing that young hero.

In judging of propriety with regard to ornaments, we muſt attend, not only to the nature of the ſubject that is to be adorned, but alſo to the circumſtances in which it is placed; the ornaments that are proper for a ball, will appear not altogether ſo decent at public worſhip; and the ſame perſon ought to dreſs differently for a marriage feaſt and for a burial.

Nothing is more intimately related to a man, than his ſentiments, words, and actions; and therefore we require here the ſtricteſt conformity. When we find what we thus require, we have a lively ſenſe of propriety: when we find the contrary, our ſenſe of impropriety is not leſs lively. Hence the univerſal diſtaſte of affectation, which conſiſts in making a ſhow of greater delicacy and refinement than is ſuited either to the character or circumſtance of the perſon.

Congruity and propriety, wherever perceived, appear agreeable; and every agreeable object produces in the mind a pleaſant emotion: incongruity and impropriety, on the other hand, are diſagreeable; and of courſe produce painful emotions. Theſe emotions, whether pleaſant or painful, ſometimes vaniſh without any conſequence; but more frequently occaſion other emotions, which we proceed to exemplify.

When any ſlight incongruity is perceived in an accidental combination of perſons or things, as of paſſengers in a ſtage-coach, or of individuals dining at an ordinary; the painful emotion of incongruity, after a momentary exiſtence, vaniſheth without producing any effect. But this is not the caſe of propriety and impropriety: voluntary acts, whether words or deeds, are imputed to the author; when proper, we reward him with our eſteem; when improper, we puniſh him with our contempt. Let us ſuppoſe, for example, a generous action ſuited to the character of the author, which raiſes in him and in every ſpectator the pleaſant emotion of propriety; this emotion generates in the author both ſelf-eſteem and joy, the former when he conſiders the relation to the action, and the latter when he conſiders the good opinion that others will entertain of him: the ſame emotion of propriety produceth in the ſpectators eſteem for the author of the action: and when they think of themſelves, it alſo produceth, by means of contraſt, an emotion of humility. To diſcover the effects of an unſuitable action, we muſt invert each of theſe circumſtances: the painful emotion of impropriety generates in the author of the action both humility and ſhame; the former when he conſiders his relation to the action, and the latter when he conſiders what others will think of him: the ſame emotion of impropriety produceth in the ſpectators contempt for the author of the action; and it alſo produceth, by means of contraſt, when they think of themſelves, an emotion of ſelf-eſteem. Here then are many different emotions, derived from the ſame action, conſidered in different views by different perſons; a machine provided with many ſprings, and not a little complicated. Propriety of action, it would ſeem, is a chief favourite of nature, when ſuch care and ſolicitude is beſtowed upon it. It is not left to our own choice; but, like juſtice, is required at our hands; and, like juſtice, is enforced by natural rewards and puniſhments: a man cannot, with impunity, do any thing unbecoming or improper; he ſuffers the chaſtiſement of contempt inflicted by others, and of ſhame inflicted by himſelf. An apparatus ſo complicated, and ſo ſingular, ought to rouſe our attention: for nature doth nothing in vain; and we may conclude with great certainty, that this curious branch of the human conſtitution is intended for ſome valuable purpoſe.

A groſs impropriety is puniſhed with contempt and indignation, which are vented againſt the offender by correſponding external expreſſions; nor is even the ſlighteſt impropriety ſuffered to paſs without ſome degree of contempt. But there are improprieties, of the ſlighter kind, that provoke laughter; of which we have examples without end, in the blunders and abſurdities of our own ſpecies: ſuch improprieties receive a different puniſhment, as will appear by what follows. The emotions of contempt and of laughter occaſioned by an impropriety of this kind, uniting intimately in the mind of the ſpectator, are expreſſed externally by a peculiar ſort of laugh, termed *a laugh of deriſion* or *ſcorn*. An impropriety that thus moves not only contempt, but laughter, is diſtinguiſhed by the epithet of *ridiculous;* and a laugh of deriſion or ſcorn is the puniſhment provided for it by nature. Nor ought it to eſcape obſervation, that we are ſo fond of inflicting this puniſhment, as ſometimes to exert it even againſt creatures of an inferior ſpecies; witneſs a turkey-cock ſwelling with pride, and ſtrutting with diſplayed feathers; a ridiculous object, which in a gay mood is apt to provoke a laugh of deriſion.

We muſt not expect, that theſe different improprieties are ſeparated by diſtinct boundaries; for of improprieties, from the ſlighteſt to the moſt groſs, from the moſt riſible to the moſt ſerious, there are degrees without end. Hence it is, that in viewing ſome unbecoming actions, too riſible for anger, and too ſerious for deriſion, the ſpectator feels a ſort of mixt emotion, partaking both of deriſion and of anger; which accounts for an expreſſion, common with reſpect to the impropriety of ſome actions, that we know not whether to laugh or be angry.

It cannot fail to be obſerved, that in the caſe of a riſible impropriety, which is always ſlight, the contempt we have for the offender is extremely faint, though deriſion, its gratification, is extremely pleaſant. This diſproportion between a paſſion and its gratification, ſeems not conformable to the analogy of nature. In looking about for a ſolution, we muſt reflect upon what is laid down above, that an improper action not only moves our contempt for the author, but alſo, by means of contraſt, ſwells the good opinion we have of ourſelves. This contributes, more than any other article, to the pleaſure we have in ridiculing follies and abſurdities; and accordingly, it is well known, that they who put the greateſt value upon themſelves are the moſt prone to laugh at others. Pride, which is a vivid paſſion, pleaſant in itſelf, and not leſs ſo in its gratification, would ſingly be ſufficient to account for the pleaſure of ridicule, without borrowing any aid from contempt. Hence appears the reaſon of a noted obſervation, That we are the moſt diſpoſed to ridicule the

the blunders and abſurdities of others, when we are in high ſpirits; for in high ſpirits, ſelf-conceit diſplays itſelf with more than ordinary vigour.

With regard to the final cauſes of congruity and impropriety; one regarding congruity, is pretty obvious, that the ſenſe of congruity, as one principle of the fine arts, contributes in a remarkable degree to our entertainment. Congruity, indeed, with reſpect to quantity coincides with proportion: when the parts of a building are nicely adjuſted to each other, it may be ſaid indifferently, that it is agreeable by the congruity of its parts, or by the proportion of its parts. But propriety, which regards voluntary agents only, can never be the ſame with proportion, a very long noſe is diſproportioned, but cannot be termed *improper*. In ſome inſtances, it is true, impropriety coincides with diſproportion in the ſame ſubject, but never in the ſame reſpect; for example, a very little man buckled to a long toledo: conſidering the man and the ſword with reſpect to ſize, we perceive a diſproportion; conſidering the ſword as the choice of the man, we perceive an impropriety.

The ſenſe of impropriety with reſpect to miſtakes, blunders, and abſurdities, is happily contrived for the good of mankind. In the ſpectators, it is productive of mirth and laughter, excellent recreation in an interval from buſineſs. But this is a trifle in reſpect of what follows. It is painful to be the ſubject of ridicule; and to puniſh with ridicule the man who is guilty of an abſurdity, tends to put him more upon his guard in time coming. Thus even the moſt innocent blunder is not committed with impunity; becauſe, were errors licenſed where they do not hurt, inattention would grow into a habit, and be the occaſion of much hurt.

The final cauſe of propriety as to moral duties, is of all the moſt illuſtrious. To have a juſt notion of it, the moral duties that reſpect others muſt be diſtinguiſhed from thoſe that reſpect ourſelves. Fidelity, gratitude, and the forbearing injury, are examples of the firſt ſort; temperance, modeſty, firmneſs of mind, are examples of the other: the former are made duties by the ſenſe of juſtice; the latter by the ſenſe of propriety. Here is a final cauſe of the ſenſe of propriety, that muſt rouſe our attention. It is undoubtedly the intereſt of every man, to ſuit his behaviour to the dignity of his nature, and to the ſtation allotted him by Providence; for ſuch rational conduct contributes in every reſpect to happineſs, by preſerving health, by procuring plenty, by gaining the eſteem of others, and, which of all is the greateſt bleſſing, by gaining a juſtly-founded ſelf-eſteem. But in a matter ſo eſſential to our well-being, even ſelf-intereſt is not relied on: the powerful authority of duty is ſuperadded to the motive of intereſt. The God of nature, in all things eſſential to our happineſs, hath obſerved one uniform method: to keep us ſteady in our conduct, he hath fortified us with natural laws and principles, which prevent many aberrations, that would daily happen were we totally ſurrendered to ſo fallible a guide as human reaſon. Propriety cannot rightly be conſidered in another light, than as the natural law that regulates our conduct with reſpect to ourſelves; as juſtice is the natural law that regulates our conduct with reſpect to others. We call propriety a law, not leſs than juſtice; becauſe both are equally rules of conduct that ought to be obeyed: propriety includes this obligation; for to ſay an action is proper, is, in other words, to ſay, that it *ought* to be performed; and to ſay it is improper, is, in other words, to ſay that it ought to be forborne. It is this very character of *ought* and *ſhould* that makes juſtice a law to us; and the ſame character is applicable to propriety, though perhaps more faintly than to juſtice: but the difference is in degree only, not in kind; and we ought, without heſitation or reluctance, to ſubmit equally to the government of both.

But it muſt, in the next place, be obſerved, that to the ſenſe of propriety, as well as of juſtice, are annexed the ſanctions of rewards and puniſhments; which evidently prove the one to be a law as well as the other. The ſatisfaction a man hath in doing his duty, joined with the eſteem and good will of others, is the reward that belongs to both equally. The puniſhments alſo, though not the ſame, are nearly allied; and differ in degree more than in quality. Diſobedience to the law of juſtice, is puniſhed with remorſe; diſobedience to the law of propriety, with ſhame, which is remorſe in a lower degree. Every tranſgreſſion of the law of juſtice raiſes indignation in the beholder; and ſo doth every flagrant tranſgreſſion of the law of propriety. Slighter improprieties receive a milder puniſhment: they are always rebuked with ſome degree of contempt, and frequently with deriſion. In general, it is true, that the rewards and puniſhments annexed to the ſenſe of propriety, are ſlighter in degree than thoſe annexed to the ſenſe of juſtice: which is wiſely ordered, becauſe duty to others is ſtill more eſſential to ſociety than duty to ourſelves; for ſociety could not ſubſiſt a moment were individuals not protected from the headſtrong and turbulent paſſion of their neighbours.

CONI, a ſtrong town of Italy in Piedmont, and capital of a territory of that name, with a good citadel. The town being divided into two factions, it ſurrendered to the French in 1641; but was reſtored to the duke of Savoy ſoon after. It is ſeated at the confluence of the rivers Greſſe and Sture. Its trade is conſiderable, being the repoſitory of all merchandiſe from Turin and Nice, deſigned for Lombardy, Switzerland, and Germany. It contains about 10,000 people beſides the garriſon. It was taken by the French in April 1796. E. Long. 7. 45. N. Lat. 44. 30.

CONIC SECTIONS.

INTRODUCTION.

IN treating of ſo conſiderable a branch of the mathematical ſciences as the Conic Sections, it would be improper to paſs over in total ſilence the hiſtory of thoſe remarkable curves. But this topic will not require any long detail. None of the works of the more early Greek geometers have reached our time; nor have we any work of antiquity profeſſedly written on the ſubject of our inquiry. Our curioſity muſt therefore reſt ſatisfied with the knowledge of a few incidental notices and facts, gleaned from different authors.

The diſcovery of the conic ſections ſeems to have originated in the ſchool of *Plato*, in which geometry was highly reſpected, and much cultivated. It is probable that the followers of that philoſopher were led to the diſcovery of theſe curves, and to the inveſtigation of many of their properties, in ſeeking to reſolve the two famous problems of the duplication of the cube, and the triſection of an angle, for which the artifices of the ordinary or plane geometry were inſufficient. Two ſolutions of the former problem, by the help of the conic ſections, are preſerved by *Eutocias*[*], and are attributed by him to *Menæchmus*, the ſcholar of *Eudoxus*, who lived not much poſterior to the time of Plato: and this circumſtance, added to a few words in an epigram of *Eratoſthenes*[†], has been thought ſufficient authority, by ſome authors, to aſcribe the honour of the diſcovery of the conic ſections to *Menæchmus*. We may at leaſt infer that, at this epoch, geometers had made ſome progreſs in developing the properties of theſe curves.

The writings of *Archimedes* that have reached us explicitly ſhew, that the geometers before his time had advanced a great length in inveſtigating the properties of the conic ſections. This author expreſsly mentions many principal propoſitions to have been demonſtrated by preceding writers; and he often refers to properties of the conic ſections, as truths commonly divulged, and known to mathematicians. His own diſcoveries in this branch of ſcience are worthy of the moſt profound and inventive genius of antiquity. In the quadrature of the parabola he gave the firſt, and the moſt remarkable inſtance that has yet been diſcovered, of the exact equality of a curvilineal to a rectilineal ſpace. He determined the proportion of the elliptic ſpaces to the circle; and he invented many propoſitions reſpecting the menſuration of the ſolids formed by the revolution of the conic ſections about their axes.

It is chiefly from the writings of *Apollonius* of Perga, a town in Pamphylia, on the ſubject of the conic ſections, that we know how far the ancient mathematicians carried their ſpeculations concerning theſe curves. *Apollonius* flouriſhed under *Ptolemy Philopator*, about forty years later than *Archimedes*. He formed his taſte for geometry, and acquired that ſuperior ſkill in the ſcience to which he is indebted for his fame, in the ſchool of Alexandria, under the ſucceſſors of *Euclid*. Beſides his great work on the conic ſections, he was the author of many ſmaller treatiſes, relating chiefly to the geometrical analyſis, the originals of which have all periſhed, and are only known to modern mathematicians by the account given of them by *Pappus* of Alexandria, in the ſeventh book of his *Mathematical Collections*.

The work of *Apollonius* on the conic ſections, written in eight books, was held in ſuch high eſtimation by the ancients, as to procure for him the name of the Great Geometer. The firſt four books of this treatiſe only have come down to us in the original Greek. It is the purpoſe of theſe four books, as we are informed in the prefatory epiſtle to *Eudemus*, to deliver the elements of the ſcience; and in this part of his labour, the author claims no farther merit than that of having collected, amplified, and reduced to order, the diſcoveries of preceding mathematicians. One improvement introduced by Apollonius is too remarkable to be paſſed over without notice. The geometers who preceded him derived each curve from a *right cone*, which they conceived to be cut by a plane perpendicular to its ſlant ſide. It will readily be perceived, from what is ſhewn in the firſt ſection of the fourth part of the following treatiſe, that the ſection would be a parabola when the vertical angle of the cone was a right angle; an ellipſe when it was acute; and a hyperbola when it was obtuſe. Thus each curve was derived from a different ſort of cone. *Apollonius* was the firſt to ſhew that all the curves are produced from any ſort of cone, whether right or oblique, according to the different inclinations of the cutting plane. This fact is one remarkable inſtance of the adherence of the mind to its firſt conceptions, and of the ſlowneſs and difficulty with which it generalizes.

The original of the firſt four books of the treatiſe of *Apollonius* is loſt; nor is it eaſy to aſcertain in what age it diſappeared. In the year 1658 *Borelli* diſcovered at Florence an Arabic manuſcript, entitled *Apollonii Pergæi Conicorum Libri Octo*. By the liberality of the *Duke of Tuſcany*, he was permitted to carry the manuſcript to Rome, and, with the aid of an Arabic ſcholar, *Abraham Ecchellenſis*, he publiſhed in 1661 a Latin tranſlation of it. The manuſcript, although from its title it was expected to be a complete tranſlation of all the eight books, was yet found to contain only the firſt ſeven books: and it is remarkable, that another manuſcript, brought from the eaſt by *Golius*, the learned profeſſor of Leyden, ſo early as 1664, as well as a third, of which *Ravius* publiſhed a tranſlation in 1669, have the ſame defect: all the three manuſcripts agreeing in the want of the eighth book, we may now conſider that part of the work of *Apollonius* as irrecoverably loſt. Fortunately, in the *Collectiones Mathematicæ* of *Pappus*, in whoſe time the entire treatiſe of *Apollonius* was extant, there is preſerved ſome account of the ſubjects treated in each book, and all the *Lemmata* required in the inveſtigations of the propoſitions they contain. *Dr Halley*, who in 1710 gave a correct edition of the Conics of *Apollonius*, guided in his reſearches by the lights derived from *Pappus*, has reſtored the eighth book with ſo much ability as to leave little room to regret the original.

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[*] In *Arch.* lib. ii. de Sph. et Cyl.

[†] Ibid.

The four laſt books of the Conics of *Apollonius*, containing the higher or more recondite parts of the ſcience, are generally ſuppoſed to be the fruit of the author's own reſearches; and they do much honour to the geometrical ſkill and invention of the Great Geometer. Even in our times the whole treatiſe muſt be regarded as a very extenſive, if not a complete work on the conic ſections. Modern mathematicians make important applications of theſe curves, with which the ancients were unacquainted; and they have been thus led to conſider the ſubject in particular points of view, ſuited to their purpoſes; but they have made few diſcoveries, of which there are not ſome traces to be found in the work of the illuſtrious ancient.

The geometers who followed *Apollonius* ſeem to have contented themſelves with the humble taſk of commenting on his treatiſe, and of rendering it of more eaſy acceſs to the bulk of mathematicians. Till about the middle of the 16th century, the hiſtory of this branch of mathematical ſcience preſents nothing remarkable. The ſtudy of it was then revived; and ſince that time this part of mathematics has been more cultivated, or has been illuſtrated by a greater variety of ingenious writings.

Among the ancients, the ſtudy of the conic ſections was a ſubject of pure intellectual ſpeculation. The applications of the properties of theſe curves in natural philoſophy have, in modern times, given to this part of the mathematics a degree of importance that it did not formerly poſſeſs. That which, in former times, might be conſidered as intereſting only to the learned theoriſt and profound mathematician, is now a neceſſary attainment to him who would not be ignorant of thoſe diſcoveries in nature, that do the greateſt honour to the preſent age.

It is curious to remark the progreſs of diſcovery, and the connexion that ſubſiſts between the different branches of human knowledge; and it excites ſome degree of admiration to reflect, that the aſtronomical diſcoveries of *Kepler*, and the ſublime theory of *Newton*, depend on the ſeemingly barren ſpeculations of the Greek geometers concerning the ſections of the cone.

Apollonius, and all the writers on conic ſections before *Dr Wallis*, derived the elementary properties of the curves from the nature of the cone. In the ſecond part of his treatiſe *De Sectionibus Conicis*, publiſhed in 1665, Dr Wallis laid aſide the conſideration of the cone, deriving the properties of the curves from a deſcription *in plano*. Since his time authors have been much divided as to the beſt method of defining thoſe curves, and demonſtrating their elementary properties; many of them preferring that of the ancient geometers, while others, and ſome of great note, have followed the example of *Dr Wallis*.

In ſupport of the innovation made by *Dr Wallis*, it is urged, that in the ancient manner of treating the conic ſections, young ſtudents are perplexed, and diſcouraged by the previous matter to be learnt reſpecting the generation and properties of the cone; and that they find it no eaſy matter to conceive ſteadily, and to underſtand diagrams rendered confuſed by lines drawn in different planes: all which difficulties are avoided by defining the curves *in plano* from one of their eſſential properties. It is not our intention particularly to diſcuſs this point; and we have only to add, that, in the following treatiſe, we have choſen to deduce the properties of the conic ſections from their deſcription *in plano*, as better adapted to the nature of a work deſigned for general readers.

A geometrical treatiſe on the conic ſections muſt neceſſarily be founded upon the elements of geometry. As *Euclid's* Elements of Geometry are generally ſtudied, and in every one's hands, we have choſen to refer to it in the demonſtrations. The edition we have uſed is that lately publiſhed by Profeſſor Playfair of Edinburgh. Although the references are made to Euclid's Elements, yet they will alſo apply to the treatiſe on GEOMETRY given in this Work; for a table is there given, indicating the particular propoſition of our treatiſe that correſponds to each of the moſt material propoſitions in Euclid's Elements.

The references are to be thus underſtood: (20. 1. E.) means the 20th prop. of the 1ſt book of *Euclid's* Elements: (2 cor. 20. 6. E.) means the 2d corollary to to the 20th prop. of the ſixth book of the ſame work; and ſo of others. Again, (7.) means the ſeventh propoſition of that PART of the following treatiſe in which ſuch reference happens to occur: (cor. 1.) means the corollary to the firſt propoſition: (2 cor. 3.) means the 2d corollary to the third propoſition, &c.—ſuch references being all made to the propoſitions in the diviſion of the treatiſe in which they are found.

Plate CLVI.

PART I. OF THE PARABOLA.

DEFINITIONS.

Fig. 1

I. If a ſtraight line BC, and a point without it F, be given by poſition in a plane, and a point D be ſuppoſed to move in ſuch a manner that DF, its diſtance from the given point, is equal to DB, its diſtance from the given line, the point D will deſcribe a line DAD, called a *Parabola*.

COROLLARY. The lines DF, DB, may become greater than any given line; therefore the parabola extends to a greater diſtance from the point F, and the line BC, than any that can be aſſigned.

II. The ſtraight line BC, which is given by poſition, is called the *Directrix of the Parabola*.

III. The given point F is called the *Focus*.

IV. A ſtraight line perpendicular to the directrix, terminated at one extremity by the parabola, and produced indefinitely within it, is called a *Diameter*.

V. The point in which a diameter meets the parabola is called its *Vertex*.

VI. The diameter which paſſes through the focus is called the *Axis of the parabola;* and the vertex of the axis is called the *Principal Vertex.*

Cor. A perpendicular drawn from the focus to the directrix is biſected at the vertex of the axis.

VII. A ſtraight line terminated both ways by the parabola, and biſected by a diameter, is called an *Ordinate to that diameter.*

VIII. The ſegment of a diameter between its vertex, and an ordinate, is called an *Abſciſs.*

IX. A ſtraight line quadruple the diſtance between the vertex of a diameter and the directrix, is called the *Parameter,* alſo the *Latus Rectum of that diameter.*

X. A ſtraight line meeting the parabola only in one point, and which everywhere elſe falls without it, is ſaid to *touch* the parabola at that point, and is called a *Tangent to the parabola.*

Proposition I.

The diſtance of any point without the parabola from the focus is greater than its diſtance from the directrix; and the diſtance of any point within the parabola from the focus is leſs than its diſtance from the directrix.

Fig. 2. Let DA*d* be a parabola, of which F is the focus, GC the directrix, and P a point without the curve, that is, on the ſame ſide of the curve with the directrix; PF, a line drawn to the focus, will be greater than PG, a perpendicular to the directrix. For, as PF muſt neceſſarily cut the curve, let D be the point of interſection; draw DB perpendicular to the directrix, and join PB. Becauſe D is a point in the parabola, DB=DF (Definition 1.), therefore PF=PD+DB; but PD+DB is greater than PB (20. 1. E.), and therefore ſtill greater than PG (19. 1. E.), therefore PF is greater than PG.

Again, let Q be a point within the parabola, QF, a line drawn to the focus, is leſs than QB, a perpendicular to the directrix. The perpendicular QB neceſſarily cuts the curve; let D be the point of interſection; join DF. Then DF=DB (Def. 1.), and QD+DF=QB; but QF is leſs than QD+DF, therefore QF is leſs than QB.

Corollary. A point is without or within the parabola, according as its diſtance from the focus is greater or leſs than its diſtance from the directrix.

Prop. II.

Every ſtraight line perpendicular to the directrix meets the parabola, and every diameter falls wholly within it.

Fig. 2. Let the ſtraight line BQ be perpendicular to the directrix at B, BQ ſhall meet the parabola. Draw BF to the focus, and make the angle BFP equal to FBQ; then, becauſe QBC is a right angle, QBF and PFB are each leſs than a right angle, therefore QB and PF interſect each other; let D be the point of interſection, then DB=DF (5. 1. E.); therefore, D is a point in the parabola. Again, the diameter DQ falls wholly within the parabola; for take Q any point in the diameter, and draw FQ to the focus, then QB or QD+DF is greater than QF, therefore Q is within the parabola (Cor 1.).

Cor. The parabola continually recedes from the axis, and a point may be found in the curve that ſhall be at a greater diſtance from the axis than any aſſigned line.

Prop. III.

The ſtraight line which biſects the angle contained by two ſtraight lines drawn from any point in the parabola, the one to the focus, and the other perpendicular to the directrix, is a tangent to the curve in that point.

Let D be any point in the curve; let DF be drawn to the focus, and DB perpendicular to the directrix; the ſtraight line DE, which biſects the angle FDB, is a tangent to the curve. Join BF meeting DE in I, take H any other point in DE, join HF, HB, and draw HG perpendicular to the directrix. Becauſe DF=DB, and DI is common to the triangles DFI, DBI, and the angles FDI, BDI, are equal, theſe triangles are equal and FI=IB, and hence FH=HB (4. 1. E.): but HB is greater than HG (19. 1. E.); therefore the diſtance of the point H from the focus is greater than its diſtance from the directrix, hence that point is without the parabola (Cor. 1.), and therefore HDI is a tangent to the curve at D (Def. 10.). Fig. 3.

Cor. 1. There cannot be more than one tangent to the parabola at the ſame point. For let any other line DK, except a diameter, be drawn through D; draw FK perpendicular to DK; on D for a centre, with a radius equal to DB, or DF, deſcribe a circle, cutting FK in N; draw NL parallel to the axis, meeting DK in L, and join FL. Then FK=KN (3. 3. E.) and therefore FL=LN. Now BD being perpendicular to the directrix, the circle FBN touches the directrix at B (16. 3. E.); and hence N, any other point in the circumference, is without the directrix, and on the ſame ſide of it as the parabola, therefore the point L is nearer to the focus than to the directrix, and conſequently is within the parabola. Fig. 4.

Cor. 2. A perpendicular to the axis at its vertex is a tangent to the curve. Let AM be perpendicular to the axis at the vertex A, then RS, the diſtance of any point in AM from the directrix, is equal to CA, that is to AF, and therefore is leſs than RF, the diſtance of the ſame point from the focus. Fig. 3.

Cor. 3. A ſtraight line drawn from the focus of a parabola perpendicular to a tangent, and produced to meet the directrix, is biſected by the tangent. For it has been ſhewn that FB, which is perpendicular to the tangent DI, is biſected at I.

Cor. 4. A tangent to the parabola makes equal angles with the diameter which paſſes through the point of contact, and a ſtraight line drawn from that point to the focus. For BD being produced to Q, DQ is a diameter, and the angle HDQ is equal to BDE, that is, to EDF. Fig. 3.

Cor. 5. The axis is the only diameter which is perpendicular to a tangent at its vertex. For the angle HDQ, or BDE, is the half of BDF, and therefore leſs than a right angle, except when BD and DF lie in a ſtraight line, which happens when D falls at the vertex.

Scholium.

From the property of tangents to the parabola demonſtrated in Cor. 4. the point F takes the name of the *Focus*. For rays of light proceeding parallel to the axis of a parabola, and falling upon a poliſhed ſurface whoſe figure is that produced by the revolution of the parabola about its axis, are reflected to the focus.

Prop. IV.

A ſtraight line drawn from the focus of a parabola to the interſection of two tangents to the curve, will make equal angles with ſtraight lines drawn from the focus to the points of contact.

Fig. 5. Let HP, Hp be tangents to a parabola at the points P, p; let a ſtraight line be drawn from H, their interſection, to F the focus, and let FP, Fp be drawn to the points of contact, the lines PF and pF make equal angles with HF.

Draw PK, pk perpendicular to the directrix; join HK, Hk, join alſo FK, Fk, meeting the tangents in G and g. The triangles FPH, KPH have PF equal to PK, and PH common to both, alſo the angle FPH equal to KPH (3.), therefore FH is equal to KH, and the angle HFP is equal to the angle HKP. In like manner it may be ſhewn that FH is equal to kH, and that the angle HFp is equal to the angle Hkp; therefore HK is equal to Hk, and hence the angle HKk is equal to HkK: now the angles PKk, pkK are right angles, therefore the angle HKP is equal to Hkp; but theſe angles have been ſhewn to be equal to HFP and HFp reſpectively, therefore the lines PF and pF make equal angles with HF.

Prop. V.

Two tangents to a parabola, which are limited by their mutual interſection and the points in which they touch the curve, are to each other reciprocally as the ſines of the angles they contain with ſtraight lines drawn from the points of contact to the focus.

Fig. 6. Let HP, Hp, which interſect each other at H, be tangents to a parabola at the points P, p; and let PF, pF be drawn to the focus: then

HP : Hp :: ſine HpF : ſine HPF.

Join HF; and in FP take FQ equal to Fp, and join HQ; then, the angles at F being equal (4.), the triangles HFQ, HFp are equal, therefore HQ is equal to Hp, and the angle HQF is equal to HpF. Now, in the triangle HPQ,
HP : HQ :: ſine HQP or ſine HQF : ſine HPF (by Trigon.)
therefore HP : Hp :: ſine HpF : ſine HPF.

Prop. VI.

Any ſtraight line terminated both ways by a parabola, and parallel to a tangent, is biſected by the diameter that paſſes through the point of contact; or is an ordinate to that diameter.

Fig. 7. The ſtraight line Dd, terminated by the parabola, and parallel to the tangent HPh, is biſected at E by PE the diameter that paſſes through P the point of contact.

Let KD, Kd, tangents at the points D, d, meet the tangent at the vertex in H and h; draw DL, dl, parallel to EP, meeting Hh in L and l, and draw DF, dF, PF to the focus.
Becauſe Hh is parallel to Dd,

HD : hd :: KD : Kd.

But KD, Kd being tangents to the parabola,

Sine hdF : ſine HDF :: KD : Kd (5.),

Therefore, ſine hdF : ſine HDF :: HD : hd;

Now ſine hPF : ſine hdF :: hd : hP (5.),

Therefore, (23.5.E.) ſine hPF : ſine HDF :: HD : hP; but ſine HPF, or ſine hPF : ſine HDF :: HD : HP, therefore the ratio of HD to hP is the ſame as that of HD to HP, wherefore HP=Ph.

Again, becauſe the angles HDF and hdF are reſpectively equal to HDL and hdl, (3.)

DH : dh :: ſine hdl : ſine HDL,

Now HL : DH :: ſine HDL : ſine HLD, or ſine hld (by Trigon.)
therefore (23.5.E.) HL : dh :: ſine hdl : ſine hld :: hl : dh, wherefore HL, and hl, have the ſame ratio to dh, hence HL=hl; and ſince it has been ſhewn that HP=Ph, it follows that LP=Pl, and therefore DE=Ed.

Cor. 1. Straight lines which touch a parabola at the extremities of an ordinate to a diameter interſect each other in that diameter. For Dd and Hh being ſimilarly divided at E and P, the ſtraight line which joins the points E, P, will paſs through K the vertex of the triangle DKd.

Cor. 2. Every ordinate to a diameter is parallel to a tangent at its vertex. For, if not, let a tangent be drawn parallel to the ordinate, then the diameter drawn through the point of contact would biſect the ordinate, and thus the ſame line would be biſected in two different points, which is abſurd.

Cor. 3. All the ordinates to the ſame diameter are parallel to each other.

Cor. 4. A ſtraight line that biſects two parallel chords, and terminates in the curve, is a diameter.

Cor. 5. The ordinates to the axis are perpendicular to it, and no other diameter is perpendicular to its ordinates. This is evident from 2 cor. and 5 cor. to Prop. III.

Cor. 6. Hence the axis divides the parabola into two parts which are ſimilar to each other.

Prop. VII.

If a tangent to any point in a parabola meet a diameter, and from the point of contact an ordinate be drawn to that diameter, the ſegment of the diameter between the vertex and the tangent is equal to the ſegment between the vertex and the ordinate.

Fig. 7. Let DK, a tangent to the curve at D, meet the diameter EP in K, and let DEd be an ordinate to that diameter, PK is equal to PE.

Through P, the vertex of the diameter, draw the tangent PH, meeting KD in H; draw DL parallel to EP, meeting PH in L, and draw DF, PF to the focus: then

PH : HD :: ſine HDF : ſine HPF (5.)
But the angle HDF is equal to HDL, and HPF is equal to HPK (3.), that is (becauſe of the parallel lines DL, PK) to HLD, therefore

PH : HD :: ſine HDL : ſine HLD :: HL : HD, wherefore PH=HL, and conſequently PK=DL; but PL is parallel to DE, by laſt propoſition, and therefore DL=PE, therefore PK=PE.

Prop. VIII.

If an ordinate to any diameter paſs through the focus, the abſciſs is equal to one-fourth of the parameter of that diameter, and the ordinate is equal to the whole parameter.

Fig. 8. Let DE*d*, a ſtraight line paſſing through the focus, be an ordinate to the diameter PE; the abſciſs PE is equal to $\frac{1}{4}$ the parameter, and the ordinate D*d* is equal to the whole parameter of the diameter PE.

Let DK, PI be tangents at D and P; let DK meet the diameter in K; draw PF to the focus, and DL parallel to EP. The angles KPI, IPF being equal (3.), and PI parallel to EF (2 cor. 6.), the angles PEF, PFE are alſo equal (29. 1. E.), and PE=PF=$\frac{1}{4}$ the parameter (Def. 9. and Def. 1.). Again, the angle KDE is equal to LDK (3.), and therefore equal to DKE; conſequently ED is equal to EK, or to twice EP (7.): therefore D*d* is equal to 4 EP, or to 4 PF, that is, to the parameter of the diameter.

Prop. IX.

If any two diameters of a parabola be produced to meet a tangent to the curve, the ſegments of the diameters between their vertices and the tangent are to one another as the ſquares of the ſegments of the tangent intercepted between each diameter and the point of contact.

Fig. 9. Let QH, RK, any two diameters, be produced to meet PI, a tangent to the curve at P, in the points G, I; then

$$HG : KI :: PG^2 : PI^2.$$

Let PN, a ſemi-ordinate to the diameter HQ, meet KR in O, and let PR, a ſemi-ordinate to the diameter KO, meet HN in R; from H draw parallels to NO and QR, meeting KR in L and M, thus HL is a tangent to the curve, and HM a ſemi-ordinate to KR.

Now KI=KR, and KL=KM (7.)
Therefore, by ſubtraction, LI=MR=HQ,
But LO=HN=HG (7.)
Therefore by addition, IO=GQ.

The triangles PGN, PIO, are ſimilar, as alſo PGQ, PIR,

Therefore GN : IO, or 2 GH : IO :: PG : PI,
And GQ : IR, or IO : 2IK :: PG : PI,

Hence, taking the rectangles of the correſponding terms,

$$2\,GH \cdot IO : 2\,IO \cdot IK :: PG^2 : PI^2,$$
$$\text{Therefore } GH : IK :: PG^2\ PI^2.$$

Fig. 10. Cor. The ſquares of ſemi-ordinates, and of ordinates to any diameter, arc to one another as their correſponding abſciſſes. Let HE*h*, KN*k* be ordinates to the diameter PN; draw PG a tangent to the curve at the vertex of the diameter, and complete the parallelograms PEHG, PNKI; then PG, PI are equal to EH, NK, and GH, IK to PE, PN, reſpectively; therefore $HE^2 : KN^2 :: PE :: PN$.

Prop. X.

If an ordinate be drawn to any diameter of a parabola, the rectangle under the abſciſs and the parameter of the diameter is equal to the ſquare of the ſemi-ordinate.

Let HB*h* be an ordinate to the diameter PK, the rectangle contained by PB and the parameter of the diameter is equal to the ſquare of HB, the ſemi-ordinate. Fig. 8.

Let DE*d* be that ordinate to the diameter which paſſes through the focus. The ſemi-ordinates DE, E*d* are each half of the parameter, and the abſciſs EP is one-fourth of the parameter (8.),

$$\text{Therefore } Dd : DE :: DE : PE,$$
$$\text{and } Dd \cdot PE = DE^2,$$
$$\text{But } Dd \cdot PE : Dd \cdot PB, \text{ or } PE : PB :: DE^2 : HB^2 \text{ (cor. 9.)},$$
$$\text{Therefore } Dd \cdot PB = HB^2.$$

Scholium.

It was on account of the equality of the ſquare of the ſemi-ordinate to a rectangle contained by the parameter of the diameter and the abſciſs, that Apollonius called the curve line to which the property belonged a *Parabola*.

Prop. XI.

A ſtraight line drawn from the focus of a parabola, perpendicular to a tangent, is a mean proportional between the ſtraight line drawn from the focus to the point of contact, and one fourth the parameter of the axis.

Let FB be a perpendicular from the focus upon the tangent PB, and FP a ſtraight line drawn to the point of contact; let A be the principal vertex, and therefore FA equal to one-fourth of the parameter of the axis; FB is a mean proportional between FP and FA. Fig. 11.

Produce FB and FA to meet the directrix in D and C, and join AB. The lines FC, FD are biſected at A and B (3 cor. 3.), therefore (2. 6. E.) AB is parallel to CD, or perpendicular to CF, and conſequently a tangent to the curve at A (2 cor. 3.); now BP is a tangent at P, therefore the angle AFB is equal to BFP (4.), and ſince the angles FAB, FBP are right angles, the triangles FAB, FBP are equiangular; hence

FP : FB :: FB : FA.

Cor. 1. The common interſection of a tangent, and a perpendicular from the focus to the tangent, is in a ſtraight line touching the parabola at its vertex.

Cor. 2. If PH be drawn perpendicular to the tangent meeting the axis in H, and HK be drawn perpendicular to PF, PK ſhall be equal to half the parameter of the axis. For the triangles HPK, PFB are manifeſtly equiangular, therefore

HP : PK :: PF : FB :: FB : FA :: FD : FC, But if PD by joined, the line PD is evidently perpendicular to the directrix (3), therefore the figure HPDF is a parallelogram, and HP=FD, therefore PK=FC=half the parameter of the axis.

Prop. XII.

If any ordinate and abſciſs of a parabola be completed into a parallelogram, the area of the parabola, included between the ordinate and the curve, is two thirds of the parallelogram.

Fig. 12. Let AN be any diameter of a parabola, and PQ an ordinate to that diameter. Let BC be drawn through A, parallel to PQ, and let PB, QC be drawn parallel to NA; the area comprehended by the curve line PAQ and ordinate PQ is two thirds of the parallelogram PBCQ. Join PA, QA, and draw the tangents PT, QT, meeting the diameter NA in T, and BC in E and G; through E and G draw the diameters EFD, GHK, which will biſect PA, QA in D and K, (1 cor. 6.) and through F and H, the vertices, draw the tangents RL, MV; join PF, AF, alſo QH, AH. Becauſe NA=AT (7.) and therefore PQ=2 EG, the triangle PAQ is double the triangle ETG. For the ſame reaſon the triangles PFA, QHA are double the triangles REL, VGM reſpectively, therefore the inſcribed figure PFAHQ is double the external figure TRLMV. If diameters were drawn through the points R, L, M, V, and ſtraight lines were drawn joining the vertices of every two adjacent diameters, alſo tangents at the vertices of the diameters which paſs through the points R, L, M, V, there would thus be inſcribed in the parabola a new figure which would have the ſame baſe PQ as the former, but the number of the remaining ſides double that of the former; and correſponding to it there would be a new external figure formed by the tangents at the vertices of the diameters, but ſtill the ſame proportion between the two figures would hold, or the former would be double the latter, and this would evidently be the caſe, if the operation of inſcribing and circumſcribing a new figure were repeated continually. Now it is evident that by thus increaſing continually the number of ſides of the inſcribed figure, it approaches nearer and nearer to the area of the parabola, which is its limit; alſo that the external figure approaches to the area contained by the two tangents TP, TQ and the parabolic arch PAQ, which ſpace is its limit; and ſince the limits of any two quantities which have a conſtant ratio muſt have the ſame proportion to each other as the quantities themſelves, the area contained by the parabolic arch PAQ and the ordinate PQ muſt be double the area contained by the ſame arch and the two tangents TP, TQ, and therefore muſt be two thirds of the area of the triangle TPQ, which triangle is evidently equal to the parallelogram PBCQ.

Prop. XIII. Problem.

The directrix and focus of a parabola being given by poſition, to deſcribe the parabola.

First Method. By Mechanical Deſcription.

Let AB be the given directrix, and F the focus. Fig. 13. Place the edge of a ruler ABKH along the directrix AB, and keep it fixed in that poſition. Let LCG be another ruler of ſuch a form that the part LC may ſlide along AB the edge of the fixed ruler ABKH, and the part CG may have its edge CD conſtantly perpendicular to AB. Let GDF be a ſtring of the ſame lengh as GC the edge of the moveable ruler; let one end of the ſtring be fixed at F, and the other faſtened to G, a point in the moveable ruler. By means of the pin D let the ſtring be ſtretched, ſo that the part of it between G and D may be applied cloſe to the edge of the moveable ruler, while, at the ſame time, the ruler ſlides along AB the edge of the fixed ruler; the pin D will thus be conſtrained to move along CG the edge of the ruler, and its point will trace upon the plane in which the directrix and focus are ſituated a curve line DE, which is the parabola required. For the ſtring GDF being equal in length to GDC, if GD be taken from both, there remains DF equal to DC; that is, the diſtance of the moving point D from the focus is equal to its diſtance from the directrix, therefore the point D deſcribes a parabola.

Second Method. By finding any number of points in the curve.

Fig. 14. Through the focus F draw EFC perpendicular to the directrix, and EC will be the axis. Draw any ſtraight line HE*h* parallel to the directrix, meeting the axis in E any point below the vertex; and on F as a centre, with a radius equal to CE, deſcribe a circle cutting H*h* in D and *d*; theſe will be points in the parabol arequired, as is ſufficiently evident.

Prop. XIV. Problem.

A parabola being giving by poſition, to find its directrix and focus.

Fig. 15. Let DP*d* be the given parabola; draw any two parallel chords D*d*, E*e*, and biſect them at H and K; join KH, meeting the parabola in P, the ſtraight line PHK is a diameter (4 cor. 6.), the point P is its vertex, and D*d*, E*e* are ordinate to it. In HP produced take PL equal to one fourth part of a third proportional to PH and HD, and draw LN perpendicular to PL, the line LN will evidently be the directrix (10. & Def. 9.). Draw PM parallel to the ordinates to the diameter PK, then PM will be a tangent to the curve at P (2 cor. 6.). Draw LM perpendicular to PM, and take MF=ML, and the point F will be the focus of the parabola (3 cor. 3.).

PART II. OF THE ELLIPSE.

Definitions.

Fig. 16. I. If two points F and *f* be given in a plane, and a point D be conceived to move around them in ſuch a manner that $Df+DF$, the ſum of its diſtances from them, is always the ſame, the point D will deſcribe upon the plane a line AB *a b*, which is called an *Ellipſe*.

II. The given points F, *f* are called the *Foci* of the ellipſe.

III. The point C, which biſects the ſtraight line between the foci, is called the *Centre*.

IV. The diſtacce of either focus from the centre is called the *Excentricity*.

V. A ſtraight line paſſing through the centre, and terminated both ways by the ellipſe, is called a *Diameter*.

VI. The extremities of a diameter are called its *Vertices*.

VII. The diameter which paſſes through the foci is called the *Tranſverſe Axis*, alſo the *Greater Axis*.

VIII. The diameter which is perpendicular to the tranſverſe axis is called the *Conjugate Axis*, alſo the *Leſſer Axis*.

IX. Any ſtraight line not paſſing through the centre, but terminated both ways by the ellipſe, and biſected by a diameter, is called an *Ordinate* to that diameter.

X. Each of the ſegments of a diameter intercepted between its vertices and an ordinate, is called an *Abſciſs*.

XI. A ſtraight line which meets the ellipſe in one point only, and everywhere elſe falls without it, is ſaid to *touch* the ellipſe in that point, and is called a *Tangent to the ellipſe*.

Prop. I.

If from any point in an ellipſe two ſtraight lines be drawn to the foci, their ſum is equal to the tranſverſe axis.

Fig. 17. Let AB *a b* be an ellipſe, of which F, *f* are the foci, and A *a* the tranſverſe axis; let D be any point in the curve, and DF, D*f* lines drawn to the foci, $Df+DF=Aa$.

Becauſe A, *a* are points in the ellipſe,

$$Af+AF=aF+af \text{ (Def. 1.)}$$

$$\text{therefore } Ff+2AF=Ff+2af;$$

$$\text{Hence } 2AF=2af, \text{ and } AF=af,$$

$$\text{and } Af+AF=Af\times af=Aa.$$

But D and A being points in the ellipſe,

$$Df+DF=Af+AF,$$

$$\text{therefore } Df+DF=Aa.$$

Cor. 1. The ſum of two ſtraight lines drawn from a point without the ellipſe to the foci is greater than the tranſverſe axis. And the ſum of two ſtraight lines drawn from a point within the ellipſe to the foci is leſs than the tranſverſe axis.

Let PF, P*f* be drawn from a point without the ellipſe to the foci; let P*f* meet the ellipſe in D; join FD; then $Pf+PF$ is greater than $Df+DF$ (21. 1. E.), that is, than A *a*. Again, let QF, Q*f* be drawn from a point within the ellipſe, let Q*f* meet the curve in D, and join FD; $Qf+QF$ is leſs than $Df+DF$ (21. 1. E.), that is, than A *a*. Fig. 17.

Cor. 2. A point is without or within the ellipſe, according as the ſum of two lines drawn from it to the foci is greater or leſs than the tranſverſe axis.

Cor. 3. The tranſverſe axis is biſected in the centre. Let C be the centre, then $CF=Cf$ (Def. 3.), and $FA=fa$, therefore $CA=Ca$.

Cor. 4. The diſtance of either extremity of the conjugate axis from either of the foci is equal to half the tranſverſe axis. Let B*b* be the conjugate axis; join F*b*, *fb*. Becauſe $CF=Cf$, and C*b* is common to the triangles CF*b*, C*fb*, alſo the angles at C are right angles, theſe triangles are equal; hence $Fb=fb$, and ſince $Fb+bf=Aa$, $Fb=AC$.

Cor. 5. The conjugate axis is biſected in the centre. Join *fb*, *f*B. By the laſt corollary $Bf=bf$, therefore the angles *f*BC, *fb*C are equal; now *f*C is common to the triangles *f*CB, *f*C*b*, and the angles at C are right angles, therefore (26. 1. E.) $CB=Cb$.

Prop. II.

Every diameter of an ellipſe is biſected in the centre.

Let P*p* be a diameter, it is biſected in C. For if C*p* be not equal to CP, take CQ equal to CP, and from the points P, *p*, Q draw lines to F, *f* the foci. The triangles FCP, *f*CQ, having $FC=Cf$, $PC=CQ$, and the angles at C equal, are in all reſpects equal, therefore $FP=fQ$; in like manner it appears that $fP=FQ$, therefore $FQ+fQ$ is equal to $FP+fP$, or, (Def. 1.), to $Fp+fp$, which is abſurd (21. 1. E.), therefore $CP=Cp$. Fig. 18.

Cor. 1. Every diameter meets the ellipſe in two points only.

Cor. 2. Every diameter divides the ellipſe into two parts which are equal and ſimilar, the like parts of the curve being at oppoſite extremities of the diameter.

Prop. II.

The ſquare of half the conjugate axis of an ellipſe is equal to the rectangle contained by the ſegments into which the tranſverſe axis is divided by either focus.

Draw a ſtraight line from *f*, either of the foci, to B, either of the extremities of the conjugate axis. Fig. 17.

$$\text{Then } BC^2+Cf^2=Bf^2=Ca^2, \text{ (4 cor. 1.)},$$

But becauſe A *a* is biſected at C,

$$Ca^2=Af\cdot fa+Cf^2,$$

$$\text{therefore } BC^2+Cf^2=Af\cdot fa+Cf^2,$$

$$\text{and } BC^2=Af\cdot fa.$$

Prop.

Prop. IV.

The ſtraight line which biſects the angle adjacent to that which is contained by two ſtraight lines drawn from any point in the ellipſe to the foci is a tangent to the curve in that point.

Fig. 19. Let D be any point in the curve; let DF, Df be ſtraight lines drawn to the foci, the ſtraight line DE which biſects the angle fDG adjacent to fDF, is a tangent to the curve at D.

Take H any other point in DE, take $DG=Df$, and join Hf, HF, HG, fG; let fG meet DE in I. Becauſe $Df=DG$, and DI is common to the triangles DfI, DGI and the angles fDI, GDI are equal, theſe triangles are equal, and $fI=IG$, and hence $fH=HG$ (4. 1. E.), ſo that $FH+fH=FH+HG$; but FH+HG is greater than FG, that is, greater than $FD+fD$ or Aa, therefore $FH+fH$ is greater than Aa, hence the point H is without the ellipſe (2 cor. 1.), and therefore DHI is a tangent to the curve at D (Def. 11.).

Cor. 1. There cannot be more than one tangent at the ſame point. For D is ſuch a point in the line DE that the ſum of DF, Df, the diſtances of that point from the foci, is evidently leſs than the ſum of HF, Hf, the diſtances of H any other point in that line; and if another line KDL be drawn through D, there is in like manner a point K in that line, which will be different from D, ſuch that the ſum of FK, fK is leſs than the ſum of the diſtances of any other point in KL, and therefore leſs than $FD+fD$; therefore the point K will be within the ellipſe (2 cor. 1.), and the line KL will cut the curve.

Cor. 2. A perpendicular to the tranſverſe axis at either of its extremities is a tangent to the curve. The demonſtration is the ſame as for the propoſition, if it be conſidered that when D falls at either extremity of the axis, the point I falls alſo at the extremity of the axis, and thus the tangent DE, which is always perpendicular to fI, is perpendicular to the axis.

Cor. 3. A perpendicular to the conjugate axis at either of its extremities is a tangent to the curve. For the perpendicular evidently biſects the angle adjacent to that which is contained by lines drawn from the extremity to the foci.

Cor. 4. A tangent to the ellipſe makes equal angles with ſtraight lines drawn from the point of contact to the foci. For the angle fDE being equal to GDE, is alſo equal to FDM, which is vertical to GDE.

Scholium.

From the property of the ellipſe, which forms this laſt corollary, the points F and f take the name of *Foci.* For writers on optics ſhew that if a poliſhed ſurface be formed, whoſe figure is that produced by the revolution of an ellipſe about its tranſverſe axis, rays of light which flow from one focus, and fall upon that ſurface, are reflected to the other focus, ſo that if a luminous point be placed in one focus, there is formed by reflection an image of it in the other focus.

Prop. V.

The tangents at the vertices of any diameter of an ellipſe are parallel.

Let Pp be a diameter, HPK, hpk tangents at its Fig. 18. vertices; draw ſtraight lines from P and p to F and f the foci. The triangles FCP, fCp, having $FC=fc$, $CP=Cp$ (2.), and the angles at C equal, are in all reſpects equal; and becauſe the angle FPC is equal to Cpf, FP is parallel to fp (27. 1. E.), therefore Pf is equal and parallel to pF (33. 1. E.); thus $FPfp$ is a parallelogram, of which the oppoſite angles P and p are equal (34. 1. E.). Now the angles FPH, fph are evidently half the ſupplements of theſe angles (4 cor. 4.), therefore the angles FPH, fph, and hence CPH, Cph are alſo equal, and conſequently HP is parallel to hp.

Cor. 1. If tangents be drawn to an ellipſe at the vertices of a diameter, ſtraight lines drawn from either focus to the points of contact make equal angles with theſe tangents. For the angle Fpk is equal to FPH.

Cor. 2. The axes of an ellipſe are the only diameters which are perpendicular to tangents at their vertices. For let Pp be any other diameter, then PF and pF are neceſſarily unequal, and therefore the angles FpP, FPp are alſo unequal; to theſe add the equal angles Fpk, FPH, and the angles Cpk, CPH are unequal, therefore neither of them can be a right angle (29. 1. E.).

Prop. VI.

A ſtraight line drawn from either focus of an ellipſe to the interſection of two tangents to the curve, will make equal angles with ſtraight lines drawn from the ſame focus to the points of contact.

Let HP, Hp be tangents to an ellipſe at the Fig. 20. points P, p; let a ſtraight line be drawn from H, their interſection, to F, either of the foci, and let FP, Fp be drawn to the points of contact, the lines PF and pF make equal angles with HF.

Draw Pf, pf to the other focus; in FP, Fp produced take $PK=Pf$, and $pk=pf$; join HK, Hk, and let fK, fk be drawn, meeting the tangents at G and g. The triangles fPH, KPH, have $Pf=PK$, by conſtruction, and PH common to both, alſo the angle fPH equal to KPH (4.), therefore fH is equal to KH. In like manner it may be ſhewn that fH is equal to kH, therefore HK is equal to Hk; now FK is equal to Fk, for each is equal to $FP+Pf$, or $Fp+pf$, that is, to the tranſverſe axis; therefore the triangles FKH, FkH are in all reſpects equal, and hence the angle KFH is equal to kFH; therefore PF and pF make equal angles with HF.

Prop. VII.

Two tangents to an ellipſe, which are limited by their mutual interſection, and the points in which they touch the curve, are to each other reciprocally as the ſines of the angles they contain with ſtraight lines drawn from the points of contact to either focus.

Fig. 21. LET the ſtraight lines HP, Hp, which interſect each other at H, be tangents to an ellipſe at the points P, p, and let PF, pF be drawn to either focus; then

$$HP : Hp :: \text{ſine } HpF : \text{ſine } HPF.$$

Join HF, and in FP take FQ equal to Fp, and join HQ; then the angles at F being equal (6.) the triangles HFQ, HFp are equal, therefore HQ is equal to Hp, and the angle HQF is equal to HpF. Now, in the triangle HPQ,

$$HP : HQ :: \text{ſine } HQP \text{ or ſine } HQF : \text{ſine } HPF \text{ (Trigon.)}$$
$$\text{therefore } HP : Hp :: \text{ſine } HpF : \text{ſine } HPF.$$

LEMMA.

Let KLl be a triangle, having its baſe Ll biſected at p, and let Hh, any ſtraight line parallel to the baſe, and terminated by the ſides, be biſected at P; then P, p, the points of biſection, and K, the vertex of the triangle, are in the ſame ſtraight line, and that line biſects Dd, any other ſtraight line parallel to the baſe.

Fig. 22. Complete the parallelograms KHPM, KLpN. The triangles KHh, KLl being ſimilar, and Hh, Ll ſimilarly divided at P and p,

$$KH : KL :: Hh : Ll :: HP : Lp,$$

hence the parallelograms KHPM, KLpN are ſimilar. Now they have a common angle at K, therefore they are about the ſame diameter, that is, the points K, P, p are in the ſame ſtraight line (26. 6. E.).

Next, let Dd meet Kp in E, then

$$HP : DE\ (:: KP : KE) :: Ph : Ed,$$
$$\text{therefore } DE \text{ is equal to } Dd.$$

PROP. VIII.

Any ſtraight line not paſſing through the centre, but terminated both ways by an ellipſe, and parallel to a tangent, is biſected by the diameter that paſſes through the point of contact; or is an ordinate to that diameter.

Fig. 23. THE ſtraight line Dd, terminated by the ellipſe, and parallel to the tangent HPh, is biſected at E, by Pp the diameter that paſſes through the point of contact.

Let Lpl be a tangent at the other extremity of the diameter, and let KD, Kd, tangent at the points D, d, meet the parallel tangents HPh, Lpl in the points H, L, h, l, and draw DF, dF, PF, pF to either focus. Becauſe Hh is parallel to Dd,

$$HD : hd :: KD : Kd.$$

But, KD, Kd being tangents to the ellipſe,

$$\text{Sine } hdF : \text{ſine } HDF :: KD : Kd \text{ (7.)}$$
$$\text{therefore ſine } hdF : \text{ſine } HDF :: HD : hd.$$
$$\text{Now, ſine } hPF : \text{ſine } hdF :: hd : hP \text{ (7.)}$$
$$\text{therefore (23. 5. K.) ſine } hPF : \text{ſine } HDF :: HD : hP;$$
$$\text{but ſine } HPF \text{ or ſine } hPF : \text{ſine } HDF :: HD : HP,$$

therefore the ratio of HD to hP is the ſame as that of HD to HP, wherefore PH=Ph. In the ſame manner it may be demonſtrated that pL=pl, therefore (Lemma) the diameter pP when produced paſſes through K, and biſects Dd, which is parallel to Hh or Ll, at E.

COR. 1. Straight lines which touch an ellipſe at the the extremities of an ordinate to any diameter interſect each other in that diameter.

COR. 2. Every ordinate to a diameter is parallel to a tangent at its vertex. For if not, let a tangent be drawn parallel to the ordinate, then the diameter drawn through the point of contact would biſect the ordinate, and thus the ſame line would be biſected in two different points, which is abſurd.

COR. 3. All the ordinates to the ſame diameter are parallel to each other.

COR. 4. A ſtraight line that biſects two parallel chords and terminates in the curve is a diameter.

COR. 5. The ordinates to either axis are perpendicular to that axis; and no other diameter is perpendicular to its ordinates. This follows evidently from 2 and 3 cor. to prop. 4. and 2 cor. to prop. 5.

COR. 6. Hence each axis divides the ellipſe into two parts which are ſimilar and equal.

PROP. IX.

If a tangent to an ellipſe meet a diameter, and from the point of contact an ordinate be drawn to that diameter, the ſemi-diameter will be a mean proportional between the ſegments of the diameter intercepted between the centre and the ordinate, and between the centre and the tangent.

LET DK, a tangent to the curve at D, meet the diameter pP, produced in K, and let DEd be an ordinate to that diameter. Fig. 23.

$$\text{Then } CE : CP :: CP : CK.$$

Through P and p, the vertices of the diameter, draw the tangents PH and pL, meeting KD in H and L; theſe tangents are parallel to each other (5.) and to DE, the ordinate, by the laſt propoſition. Draw PF, pF, DF to either of the foci, Then

$$\left.\begin{aligned} DH : PH &:: \text{ſine } HPF : \text{ſine } HDF \\ \text{and}\quad DL : pL &:: \text{ſine } LpF : \text{ſine } LDF \end{aligned}\right\} (7.)$$

Now the angles HPF, LpF are equal (cor. 5.) and the ſine of HDF is the ſame as that of LDF, therefore

$$DH : PH :: DL : pL,$$

and by alternation,

$$DH : DL :: PH : pL;$$

therefore, becauſe of the parallel lines PH, ED, pL,

$$EP : Ep :: PK : pK.$$

Take $CG=CE$, then by diviſion

$$EG : EP :: Pp : PK,$$

and taking the halves of the antecedents,

$$CE : EP :: CP : PK;$$

hence, by compoſition, $CE : CP :: CP : CK$.

Cor. 1. The rectangle contained by PE and Ep is equal to the rectangle contained by KE and CE.

For $PC^2 = KC\cdot CE = KE\cdot EC + EC^2$ (3. 2. E.)
alſo $PC^2 = PE\cdot Ep + EC^2$ (5. 2. E.)
therefore $KE\cdot EC + EC^2 = PE\cdot Ep + EC^2$,
and $KE\cdot EC = PE\cdot Ep$.

Cor. 2. The rectangle contained by PK and Kp is equal to the rectangle contained by KE and KC.

For $KC^2 = PK\cdot Kp + CP^2$ (6. 2. E.)
alſo $KC^2 = EK\cdot KC + EC\cdot KC = EK\cdot KC + CP^2$ (1. 2. E. and by the prop.)
therefore $PK\cdot Kp + CP^2 = EK\cdot KC + CP^2$,
and $PK\cdot Kp = EK\cdot KC$.

Prop. X.

If a diameter of an ellipſe be parallel to the ordinates to another diameter, the latter diameter ſhall be parallel to the ordinates to the former.

Fig. 24. Let Pp, a diameter of an ellipſe, be parallel to DEd any ordinate to the diameter Qq, the diameter Qq ſhall be parallel to the ordinates to the diameter Pp

Draw the diameter dCG through one extremity of the ordinate dD, and join G and D, the other extremity, meeting Pp in H. Becauſe dG is biſected at C, and CH is parallel to dD, the line DG is biſected at H, therefore DG is an ordinate to the diameter Pp. And becauſe dG and dD are biſected at C and E, the diameter Qq is parallel to DG (2. 6. E.) therefore Qq is parallel to any ordinate to the diameter Pp.

Definitions.

XII. Two diameters are ſaid to be *conjugate* to one another when each is parallel to the ordinates to the other diameter.

Cor. Diameters which are conjugate to one another are parallel to tangents at the vertices of each other.

XIII. A third proportional to any diameter and its conjugate is called the *Parameter*, alſo the *Latus rectum of that diameter*.

Prop. XI.

If an ordinate be drawn to any diameter of an ellipſe, the rectangle under the abſciſſes of the diameter will be to the ſquare of the ſemi-ordinate as the ſquare of the diameter to the ſquare of its conjugate.

Fig. 25. Let DEd be an ordinate to the diameter Pp, and let Qq be its conjugate, then

$$PE\cdot Ep : DE^2 :: Pp^2 : Qq^2.$$

Let KDL a tangent at D meet the diameter in K, and its conjugate in L; draw DG parallel to Pp, meeting Qq in G. Becauſe CP is a mean proportional between CE and CK (9.)

$$CP^2 : CE^2 :: CK : CE \text{ (2 cor. 20. 6. E.)}$$

and by diviſion $CP^2 : PE\cdot Ep :: CK : KE$.

But, becauſe ED is parallel to CL,

$$CK : KE :: CL : DE \text{ or } CG,$$

and becauſe CQ is a mean proportional between CG and CL (9.)

$$CL : CG :: CQ^2 : CG^2 \text{ or } ED^2;$$

therefore $CP^2 : PE\cdot Ep :: CQ^2 : DE^2$,

and by inverſion and alternation,

$$PE\cdot Ep : DE^2 :: CP^2 : CQ^2 :: Pp^2 : Qq^2.$$

Cor. 1. The ſquares of ſemi-ordinates and of ordinates to any diameter of an ellipſe are to one another as the rectangles contained by the correſponding abſciſſes.

Cor. 2. The ordinates to any diameter, which intercept equal ſegments of that diameter from the centre, are equal to one another, and, converſely, equal ordinates intercept equal ſegments of the diameter from the centre.

Cor. 3. If a circle be deſcribed upon Aa, either of the axes of an ellipſe, as a diameter, and DE, de, any two ſemi-ordinates to the axes meet the circle in H and h, DE ſhall be to de as HE to he. For Fig. 26.

$$DE^2 : de^2 :: AE\cdot Ea : Ae.ea\ HE^2 : he^2,$$

therefore $DE : de :: HE : he$.

Cor. 4. If a circle be deſcribed on Aa the tranſverſe axis as a diameter, and DE, any ordinate to the axis, be produced to meet the circle in H, HE ſhall be to DE as the tranſverſe axis Aa to the conjugate axis Bb. For, produce the conjugate axis to meet the circle in K, then, by laſt corollary,

$$HE : DE :: KC, \text{ or } AC : BC :: Aa : Bb.$$

Cor. 5. And if HE be divided at D, ſo that HE is to DE, as the tranſverſe axis to the conjugate axis, D is a point in the ellipſe, and DE a ſemi-ordinate to the axis Aa.

Prop. XII.

The tranſverſe axis of an ellipſe is the greateſt of all its diameters, and the conjugate axis is the leaſt of all its diameters.

Let Aa be the tranſverſe axis, Bb the conjugate Fig. 26. axis, and CD any ſemidiameter. Draw DE perpendicular to Aa, and DL perpendicular to Bb.

Becauſe $Aa^2 : Bb^2 :: AE\cdot Ea : DE^2$ (11.)
and Aa^2 is greater than Bb^2,
therefore $AE\cdot Ea$ is greater than DE^2;
and $AE\cdot Ea + EC^2$ is greater than $DE^2 + EC^2$,
that is, AC^2 is greater than DC^2,
therefore, AC is greater than DC.

By the ſame manner of reaſoning it may be ſhewn that becauſe Bb^2 is leſs than Aa^2,

$BL \cdot Lb + CL^2$ is leſs than $DL^2 + CL^2$;
that is, BC^2 is leſs than DC^2,
and BC leſs than DC.

PROP. XIII.

If an ordinate be drawn to any diameter of an ellipſe, the rectangle under the abſciſſes of the diameter is to the ſquare of the ſemi-ordinate as the diameter to its parameter.

Fig. 27. LET DE be a ſemi-ordinate to the diameter Pp, let PG be the parameter of the diameter, and Qq the conjugate diameter. By the definition of the parameter (Def. 13.)

$Pp : Qq :: Qq : PG$,
therefore $Pp : PG :: Pp^2 : Qq^2$ (2 cor. 20. 6. E.)
But $Pp^2 : Qq^2 :: PE \cdot Ep : DE^2$, (11.)
therefore $PE \cdot Ep : DE^2 :: Pp : PG$.

COR. Let the parameter PG be perpendicular to the diameter Pp; join pG, and from E draw EM parallel to PG, meeting pG in M. The ſquare of DE, the ſemi-ordinate, is equal to the rectangle contained by PE and EM.

For $PE \cdot Ep : DE^2 :: Pp : PG$,
and $Pp : PG :: Ep : EM :: PE \cdot Ep : PE \cdot EM$,
therefore $DE^2 = PE \cdot EM$.

SCHOLIUM.

If the rectangles $PGLp$, HGKM be completed, it will appear that the ſquare of ED is equal to the rectangle MP, which rectangle is leſs than the rectangle KP, contained by the abſciſs PE and parameter PG, by a rectangle KH ſimilar and ſimilarly ſituated to LP, the rectangle contained by the diameter and parameter. It was on account of the deficiency of the ſquare of the ordinate from the rectangle contained by the abſciſs and parameter that Apollonius called the curve line to which the property belonged an Ellipſe.

PROP. XIV.

If from the vertices of two conjugate diameters of an ellipſe there be drawn ordinates to any third diameter, the ſquare of the ſegment of that diameter intercepted between either ordinate and the centre is equal to the rectangle contained by the ſegments between the other ordinate and the vertices of the ſame diameter.

LET Pp, Qq be two conjugate diameters, and PE, QG ſemi-ordinates to any third diameter Rr, then $CG^2 = RE \cdot Er$, and $CE^2 = RG \cdot Gr$. Fig. 28.

Draw the tangents PH, QK meeting Rr in H and K. The rectangles $HC \cdot CE$ and $KC \cdot CG$ are equal, for each is equal CR^2 (9.), therefore

$HC : CK :: CG : CE$.

But the triangles HPC, CQK are evidently ſimilar (cor. def. 12.) and PE being parallel to QG their baſes CH, KC are ſimilarly divided at E and G, therefore

$HC : CK :: HE : CG$,
wherefore $CG : CE :: HE : CG$,
conſequently $CG^2 = CE \cdot EH =$ (1 cor. 9.) $RE \cdot Er$.
In like manner it may be ſhewn that $CE^2 = RG \cdot Gr$.

COR. 1. Let Ss be the diameter that is conjugate to Rr, then Rr is to Ss as CG to PE, or as CE to QG.

For $Rr^2 : Ss^2 :: RE \cdot Er$, or $CG^2 : PE^2$,
therefore $Rr : Ss :: CG : PE$.

In like manner $Rr : Ss :: CE : QG$.

COR. 2. The ſum of the ſquares of CE, CG, the ſegments of the diameter to which the ſemi-ordinates PE, QG are drawn, is equal to the ſquare of CR the ſemi-diameter.

For $CE^2 + CG^2 = CE^2 + RE \cdot EG = CR^2$.

COR. 3. The ſum of the ſquares of any two conjugate diameters is equal to the ſum of the ſquares of the axes.

Let Rr, Ss be the axes and Pp, Qq any two conjugate diameters; draw PE, QG perpendicular to Rr, and PL, QM perpendicular to Ss. Then

$CE^2 + CG^2 = CR^2$, and $CM^2 + CL^2$, or $GQ^2 + PE^2 = CS^2$;
therefore $CE^2 + PE^2 + CG^2 + GQ^2 = CR^2 + CS^2$,
that is (47. 1. E.), $CP^2 + CQ^2 = CR^2 + CS^2$,
therefore $Pp^2 + Qq^2 = Rr^2 + Ss^2$.

PROP. XV.

If four ſtraight lines be drawn touching an ellipſe at the vertices of any two conjugate diameters, the parallelogram formed by theſe lines is equal to the rectangle contained by the tranſverſe and conjugate axes.

Fig. 29. LET Pp, Qq be any two conjugate diameters, a parallelogram DEGH formed by tangents to the curve at their vertices is equal to the rectangle contained by Aa, Bb the two axes.

Produce Aa, one of the axes, to meet the tangent PE in K, join QK, and draw PL, QM perpendicular to Aa.

Becauſe $CK : CA :: CA : CL$ (9.)
and $CA : CB :: CL : QM$ (1 cor. 14.)
ex aeq. $CK : CB :: CA : QM$.
therefore $CK \cdot QM = CB \cdot CA$.

But $CK \cdot QM =$ twice trian. $CKQ =$ paral. CPEQ, therefore the parallelogram $CPEQ = CB \cdot CA$, and taking the quadruples of theſe, the parallelogram DEGH is equal to the rectangle contained by Aa and Bb.

PROP. XVI.

If two tangents at the vertices of any diameter of an ellipſe meet a third tangent, the rectangle contained by their ſegments between the points Plate LVIII.

Of the Ellipſe.

of contact and the points of interſection is equal to the ſquare of the ſemi-diameter to which they are parallel. And the rectangle contained by the ſegments of the third tangent between its point of contact and the parallel tangents is equal to the ſquare of the ſemi-diameter to which it is parallel.

Fig. 30.

Let PH, *p h*, tangents at the vertices of a diameter P*p* meet HD*h*, a tangent to a curve at any point D, in H and *h*; let CQ be the ſemi-diameter to which the tangents PH, *p h* are parallel, and CR that to which H *h* is parallel, then,

$$PH \cdot ph = CQ^2, \text{ and } DH \cdot Dh = CR^2.$$

If the tangent HD*h* be parallel to P*p* the propoſition is manifeſt. If it is not parallel, let it meet the ſemi-diameters CP, CQ, in L and K. Draw DE, RM parallel to CQ, and DG parallel to CP.

$$\text{Becauſe } LP \cdot Lp = LE \cdot LC \text{ (2 cor. 9.)},$$
$$LP : LE :: LC : Lp,$$

hence, and becauſe of the parallels PH, ED, CK, *p h*,

$$PH : ED :: CK : ph,$$
$$\text{wherefore } PH \cdot ph = ED \cdot CK,$$
$$\text{but } ED \cdot CK = CG \cdot CK = CQ^2 \text{ (9.)}$$
$$\text{therefore } PH \cdot ph = CQ^2.$$

Again the triangles LED, CMR are evidently ſimilar, and LE, LD ſimilarly divided at H and P, alſo at *h* and *p*,

$$\text{therefore } PE : HD :: (LE : LD ::)\ CM : CR,$$
$$\text{alſo } pE : hD :: (LE : LD ::)\ CM : CR,$$

hence, taking the rectangles of the correſponding terms,

$$PE \cdot pE : HD \cdot hD :: CM^2 : CR^2.$$

But if CD be joined, the points D and R are evidently the vertices of two conjugate diameters (cor. Def. 12.) and therefore PE · *p*E = CM² (14.)

$$\text{therefore } HD \cdot hD = CR^2.$$

Cor. The rectangle contained by LD and DK, the ſegments of a tangent intercepted between D the point of contact and P*p*, Q*q*, any two conjugate diameters, is equal to the ſquare of CR, the ſemi-diameter to which the tangent is parallel.

Let the parallel tangents PH, *p h* meet LK in H and *h*, and draw DE a ſemi-ordinate to P*p*. Becauſe of the parallels PH, ED, CK, *p h*,

$$LE : LD :: EP : DH,$$
$$\text{and } EC : DK :: Ep : Dh,$$
$$\text{therefore } LE \cdot EC :: LD \cdot DK :: EP \cdot Ep : DH \cdot Dh.$$
$$\text{But } LE \cdot EC = EP \cdot Ep \text{ (1 cor. 9.)}$$
$$\text{therefore } LD \cdot DK = DH \cdot Dh = \text{(by this prop.) } CR^2.$$

Prop. XVII.

If two ſtraight lines be drawn from the foci of an ellipſe perpendicular to a tangent, ſtraight lines drawn from the centre to the points in which they meet the tangent will each be equal to half the tranſverſe axis.

Of the Ellipſe. Fig. 31.

Let DP*d* be a tangent to the curve at P, and FD, *fd* perpendiculars to the tangent from the foci, the ſtraight lines joining the points C, D, and C, *d*, are each equal to AC half the tranſverſe axis.

Join FP *f*P, and produce FD, *f*P till they interſect in E. The trangles FDP, EDP, have the angles at D right angles, and the angles FPD, EPD equal (4.) and the ſide DP common to both, they are therefore equal, and conſequently have ED = DF, and EP = PF, wherefore E*f* = FP + P*f* = A*a*. Now the ſtraight lines FE, F*f* being biſected at D and C, the line DC is parallel to E*f*, and thus the triangles F*f*E, FCD are ſimilar,

$$\text{therefore } Ff : fE \text{ or } Aa :: FC : CD,$$

but FC is half of F*f*, therefore CD is half of A*a*. In like manner it may be ſhewn that C*d* is half of A*a*.

Cor. If the diameter Q*q* be drawn parallel to the tangent D*d*, it will cut off from PF, P*f* the ſegments PG, P*g*, each equal to AC half the tranſverſe axis. For C*d*PG, CD P*g* are parallelograms, therefore PG = *d* C = AC, and P*g* = DC = AC.

Prop. XVIII.

The rectangle contained by perpendiculars drawn from the foci of an ellipſe to a tangent is equal to the ſquare of half the conjugate axis.

Fig. 31.

Let DP*d* be a tangent, and FD, *fd* perpendiculars from the foci, the rectangle contained by FD and *fd* is equal to the ſquare of CB half the conjugate axis.

It is evident from the laſt propoſition that the points D, *d* are in the circumference of a circle whoſe centre is the centre of the ellipſe, and radius CA, half the tranſverſe axis; now FD*d* being a right angle, if *d* C be joined, the lines DF, *d*C when produced will meet at H, a point in the circumference; and ſince FC = *f*C, and CH = C*d*, and the angles FCH, *f*C*d* are equal, FH is equal to *fd*, therefore

$$DF \cdot df = DF \cdot FH = AF \cdot Fa \text{ (35. 3. E)} = CB^2 \text{ (3.)}.$$

Cor. If PF, P*f* be drawn from the point of contact to the foci, the ſquare of FD is a fourth proportional to *f*P, FP and BC². For the lines *f*P, FP make equal angles with the tangent (4 cor. 4.) and *fd* P, FDP are right angles, therefore the triangles *f*P*d*, FPD are ſimilar, and

$$fP : FP :: fd : FD :: fd \cdot FD \text{ or } CB^2 : FD^2.$$

Prop. XIX.

Fig. 32.

If from C the centre of an ellipſe a ſtraight line CL be drawn perpendicular to a tangent LD, and from D the point of contact a perpendicular be drawn to the tangent, meeting the tranſverſe axis in H and the conjugate axis in *h*, the rectangle contained by CL and DH is equal to the ſquare of CB, the ſemi-conjugate axis; and the rectangle contained by CL and D*h* is equal to the ſquare of CA, the ſemi-tranſverſe axis.

Produce the axes to meet the tangent in M and *m*, and from D draw the ſemi-ordinates DE, D *e*, which will be perpendicular to the axes.

The triangles DEH, CLm are evidently equi-angular, therefore

$$DH : DE :: Cm : CL,$$
$$\text{hence } CL \cdot DH = DE \cdot Cm;$$
$$\text{but } DE \cdot Cm, \text{ or } Ce \cdot Cm = BC^2,$$
$$\text{therefore } CL \cdot DH = BC^2.$$

In the ſame way it is ſhewn that $CL \cdot Dh = AC^2$.

Cor. 1. If a perpendicular be drawn to a tangent at the point of contact, the ſegments intercepted between the points of contact, and the axes, are to each other reciprocally as the ſquares of the axes by which they are terminated.

For $AC^2 : BC^2 :: CL \cdot Dh : CL \cdot DH :: Dh : DH$.

Cor. 2. If DF be drawn to either focus, and HK be drawn perpendicular to DF, the ſtraight line DK ſhall be equal to half the parameter of the tranſverſe axis.

Draw CG parallel to the tangent at D, meeting DH in N, and DF in G. The triangles GDN, HDK are ſimilar, therefore

$$GD : DN :: HD : DK, \text{ and hence } GD \cdot DK = HD \cdot DN.$$
$$\text{But } GD = AC \text{ (cor. 17.) and } ND = CL,$$
$$\text{therefore } AC \cdot DK = HD \cdot CL = \text{(by the prop.) } CB^2.$$
$$\text{wherefore } AC : BC :: BC : DK, \text{ hence } DK \text{ is half the parameter of } Aa \text{ (Def. 13.).}$$

Definitions.

Fig. 33. XIV. If a point G be taken in the tranſverſe axis of an ellipſe produced, ſo that the diſtance of G from the centre may be a third proportional to CF the excentricity, and CA the ſemi-tranſverſe axis, a ſtraight line HGh, drawn through G perpendicular to the axis, is called the *Directrix of the ellipſe*.

Cor. 1. If MFm, an ordinate to the axis, be drawn through the focus, tangents to the ellipſe at the extremities of the ordinate will meet the axis at the point G. (9.)

Cor. 2. The ellipſe has two directrices, for the point G may be taken on either ſide of the centre.

Prop. XX.

The diſtance of any point in an ellipſe from either directrix is to its diſtance from the focus neareſt that directrix in the conſtant ratio of the ſemi-tranſverſe axis to the excentricity.

Fig. 33. Let D be any point in the ellipſe, let DK be drawn perpendicular to the directrix, and let DF be drawn to the focus neareſt the directrix; DK is to DF as CA, half the tranſverſe axis, to CF, the excentricity.

Draw Df to the other focus, and DE perpendicular to Aa, take L a point in the axis, ſo that AL = FD, and conſequently La = Df, then CL is evidently half the difference between AL and aL, or FD and fD, and CE half the difference between fE and FE, and becauſe

$$Df + DF : fF :: fE - FE : Df - DF \text{ (Trigon.)}$$

By taking the halves of the terms of the proportion

$$CA : CF :: CE : CL,$$
$$\text{But } CA : CF :: CG : CA \text{ (Def. 14.)}$$
$$\text{therefore } CG : CA :: CE : CL,$$
$$\text{hence (20. 5. E.) } EG : AL :: CG : CA :: CA : CF,$$
$$\text{that is, } DK : DF :: CA : CF.$$

Cor. 1. If the tangent GMN be drawn through M, the extremity of the ordinate paſſing through the focus, and ED be produced to meet GM in N, EN ſhall be equal to DF. For draw MO perpendicular to the directrix, then, becauſe M and D are points in the ellipſe, and from ſimilar triangles,

$$FM : FD :: MO : DK :: GF : GE :: FM : EN,$$
$$\text{therefore } FD = EN.$$

Cor. 2. If AI and $a\,i$ be drawn perpendicular to the tranſverſe axis at its extremities, meeting the tangent GM in I, and i, then AI = AF and $a\,i$ = aF. This follows evidently from laſt corollary.

Prop. XXI.

Let Aa, Bb be the tranſverſe and conjugate axes of an ellipſe; from K any point in the conjugate axis let a ſtraight line KH, which is equal to the ſum or difference of the ſemi-axes CA, CB, be placed ſo as to meet the tranſverſe axis in H, and in KH, produced beyond H when KH is the difference of the ſemi-axes, let HD be taken equal to CB; the point D is in the ellipſe. Fig. 34

Draw DE perpendicular to Aa, and through C draw CG parallel to KD, meeting ED in G, then CG = KD = AC by conſtruction, hence G is in the circumference of a circle of which C is the centre, and CA the radius; and becauſe the triangles CEG, HED are ſimilar,

$$GE : DE :: CG : HD :: CA : CB,$$

therefore DE is a ſemi-ordinate, and D a point in the ellipſe (5 Cor. 11.).

Scholium.

The inſtrument called the *trammels*, alſo the *elliptic compaſſes*, which workmen uſe for deſcribing elliptic curves, is conſtructed on the property of the curve demonſtrated in this propoſition. (See Compasses.) Upon the ſame principle lathes are conſtructed for turning picture frames, &c. of an oval form.

Prop. XXII.

If a circle be deſcribed on the tranſverſe axis of an ellipſe as a diameter, the area of the circle will be to the area of the ellipſe as the tranſverſe axis to the conjugate axis.

Let Aa be the tranſverſe axis of the ellipſe, which is alſo the diameter of the circle. Draw DE, D′E′, D″E″ any number of perpendiculars to the axis, meeting the ellipſe in D, D′, D″, and the circle in d, d', d'', and join AD, DD′, D′D″, D″a; alſo Ad, dd', $d'd''$, Fig. 35.

$d''a''$, $d''a$, and draw DG, dg parallel to Aa, meeting $d'E'$ in G and g.

The triangle AdE is to the triangle ADE as dE to DE, that is (4. cor. 11.) as the tranſverſe axis to the conjugate axis. Again, becauſe $d'E'$ and dE are ſimilarly divided at D' and D (3. cor. 11.)

$$dE : DE :: (d'E' - dE : D'E' - DE ::)\ d'g : D'G,$$

But, triangle dgd' : triangle DGD' :: $d'g : D'G$,

therefore the triangles dgd', DGD' as well as the rectangles dE', DE' are to each other as dE to DE, or as the tranſverſe axis to the conjugate axis, and conſequently the trapezoids $dEE'd'$, $DEE'D'$ are to each other in the ſame ratio. In like manner it may be ſhewn, that the trapezoids $d'E'E''d''$, $D'E'E''D''$, alſo the triangles $d''E''a$, $D''E''a$ are to each other as the tranſverſe to the conjugate axis, and therefore the whole rectilineal figure $Add'd''a$ inſcribed in the ſemicircle to the whole figure $ADD'D''a$ inſcribed in the ſemiellipſe in the ſame ratio, which ratio is conſtant, and altogether independent of the number of the ſides of each figure. But, the baſe Aa remaining common to both figures, if we ſuppoſe the number of perpendiculars dDE, $d'D'E'$, &c. indefinitely increaſed, it is evident that the polygons $Add'd''a$, $ADD'D''a$ will approach nearer and nearer to the ſemicircle and ſemiellipſe, which are their reſpective limits, therefore, the ſemicircle is to the ſemiellipſe, and conſequently the circle is to the ellipſe, as the tranſverſe to the conjugate axis.

Cor. The area of an ellipſe is equal to the area of a circle, whoſe diameter is a mean proportional between the axes.

Prop. XXIII. Problem.

Two unequal ſtraight lines which biſect each other at right angles being given by poſition, to deſcribe an ellipſe of which theſe may be the two axes.

First Method. By a Mechanical Deſcription.

Fig. 36. Let Aa, Bb be the tranſverſe and conjugate axes, and C the centre. On B, one extremity of the conjugate axis, as a centre, with a radius equal to AC, half the tranſverſe axis, let a circle be deſcribed, cutting the tranſverſe axis in F and f; theſe points will be the foci of the ellipſe (4 cor. 1.).

Let the ends of a ſtring, equal in length to Aa, be faſtened at the points F, f, and let the ſtring be ſtretched by a pin D, and while it is kept uniformly tenſe, let the point of the pin be carried round in the plane in which the lines Aa, Bb are ſituated, till it return to the place from which it ſet out; by this motion the point of the pin will trace upon the plane a curve line which is the ellipſe required, as is evident from the definition of the Ellipſe.

Second Method. By Finding any Number of Points in the Curve.

Find F either of the foci as before; draw HAK hak, perpendicular to the tranſverſe axis at its extremities, and take AH and AK on each ſide of the vertex equal to AF, alſo ah and ak each equal to aF, join Hh and Kk, take E any point in Aa, and through E draw NEn parallel to HK, meeting Hh and Kk in N and n. On F as a centre with a radius equal to EN or En let a circle be deſcribed, meeting Nn in D and d, theſe will be two points in the ellipſe, and in the ſame way may any number of points be found. The reaſon of this conſtruction is obvious from cor. 1. and 2. to prop. 20. Fig. 37.

Prop. XXIV. Problem.

An ellipſe being given by poſition, to find its axes.

Let ABab be the given ellipſe. Draw two parallel chords Hh, Kk, and biſect them at L and M; join LM, and produce it to meet the ellipſe in P and p, then, Pp is a diameter (4. cor. 8.). Biſect Pp in C, the point C is the centre of the ellipſe (2.). Fig. 38.

Take D any point in the ellipſe, and on C as a centre with the diſtance CD deſcribe a circle. If this circle fall wholly without the curve, then CD muſt be half the tranſverſe axis; and if it fall wholly within the curve, then CD muſt be half the conjugate axis (12.). If the circle neither falls wholly without the curve, nor wholly within it, let the circle meet it again in d, join Dd, and biſect Dd in E, join CE, which produce to meet the ellipſe in A and a, then Aa will be one of the axes (5. cor. 8.), for it is perpendicular to Dd (3. 3. E.) which is an ordinate to Aa. The other axis Bb will be found by drawing a ſtraight line through the centre perpendicular to Aa.

PART III. OF THE HYPERBOLA.

Definitions.

Fig. 39. I. If two points F, f be given in a plane, and a point D be conceived to move in ſuch a manner that Df—DF, the difference of its diſtances from them is always the ſame, the point D will deſcribe upon the plane a line DAD′ called an *Hyperbola*. By aſſuming firſt one of the given points F, and then the other f as that to which the moving point is neareſt, the difference of the lines DF and Df in both caſes being the ſame, there will be two hyperbolas DAD′, dad', deſcribed, oppoſite to one another, which are therefore called *Oppoſite Hyperbolas*.

Cor. The lines DF, Df may become greater than any given line, therefore the hyperbolas extend to a greater diſtance from the given points F, f than any which can be aſſigned.

II. The given points F, f are called the *Foci of the hyperbola*.

III. The point C, which biſects the ſtraight line between the foci, is called the *Centre*.

IV. A ſtraight line paſſing through the centre, and terminated by the oppoſite hyperbolas, is called a *Tranſverſe Diameter*. It is alſo ſometimes called, ſimply, a *Diameter*.

V. The extremities of a diameter are called its *Vertices*.

VI. The diameter which paſſes through the foci, is called the *Tranſverſe Axis*.

Cor. The vertices of the tranſverſe axis lie between the foci. Let A be either of the vertices, then, becauſe any ſide of a triangle is greater than the difference between the other two ſides, Ff is greater than $fD-DF$ which is equal to $fA-FA$ (Def. 1.). Now this can only take place when A is between F and f.

VII. A ſtraight line Bb paſſing through the centre, perpendicular to the tranſverſe axis, and limited at B and b by a circle deſcribed on one extremity of that axis, with a radius equal to the diſtance of either focus from the centre, is called the *Conjugate Axis*. It is alſo called the *Second Axis*.

Cor. The conjugate axis is biſected in the centre. This appears from 3. 3. E.

VIII. Any ſtraight line terminated both ways by the hyperbola, and biſected by a tranſverſe diameter produced, is called an *Ordinate* to that diameter.

IX. Each of the ſegments of a tranſverſe diameter produced, intercepted by its vertices, and an ordinate, is called an *Abſciſs*.

X. A ſtraight line which meets the hyperbola in one point only, and which everywhere elſe falls without the oppoſite hyperbolas, is ſaid to *touch* the hyperbola in that point, and is called a *Tangent to the hyperbola*.

Prop. I.

If from any point in an hyperbola two ſtraight lines be drawn to the foci, their difference is equal to the tranſverſe axis.

Fig. 39. Let DAD', dad' be oppoſite hyperbolas, of which F, f are the foci, and Aa the tranſverſe axis; let D be any point in the curve, and DF, Df lines drawn to the foci, $Df-DF=Aa$.

Becauſe A and a are points in the hyperbola,

$$\begin{gathered} Af-AF=aF-af \text{ (Def. 1.)} \\ \text{therefore } Ff-2AF=Ff-2af; \\ \text{Hence } 2AF=2af \text{ and } AF=af, \\ \text{and } Af-AF=Af-af=Aa. \end{gathered}$$

But D and A being points in the hyperbola,

$$Df-DF=Af-AF, \text{ therefore } Df-DF=Aa.$$

Cor. 1. The difference of two ſtraight lines drawn from a point without the oppoſite hyperbolas to the foci is leſs than the tranſverſe axis, and the difference of two ſtraight lines drawn from a point within either of them to the foci is greater than the tranſverſe axis.

Fig. 40. Let Pf, PF be lines drawn from a point without the hyperbolas, that is, between the curve and its conjugate axis. The line PF muſt neceſſarily meet the curve, let D be the point of interſection; Pf is leſs than $PD+Df$ (20. 1. E.), therefore $Pf-PF$ is leſs than $(PD+Df)-PF$, that is, leſs than $Df-DF$, or Aa. Again, let Qf, QF be lines drawn from a point within either of the hyperbolas, Qf muſt neceſſarily meet the curve; let D be the point of interſection, join FD; QF is greater than $QD+DF$, and therefore $Qf-CF$ is greater than $Qf-(QD+DF)$, that is, greater than $Df-DF$ or Aa.

Cor. 2. A point is without, or within the hyperbolas, according as the difference of two lines drawn from that point to the foci is leſs or greater than the tranſverſe axis.

Cor. 3. The tranſverſe axis is biſected in the centre. Let C be the centre; then $CF=Cf$ (Def. 3.), and $FA=fa$, therefore $CA=Ca$.

Lemma. I.

Fig. 41. Two triangles ABC, ADC on the ſame baſe, and on the ſame ſide of it, having AB, AD, the greater of the two ſides of each ending in the ſame extremity of the baſe, and having their vertical angles B, D without each other, cannot have the difference of the ſides of the one equal to the difference of the ſides of the other.

Let AD meet BC in E. Becauſe $AE+EB$ is greater than AB, $(AE+EB)-BC=AE-EC$ is greater than $AB-BC$. Again, becauſe DC is leſs than $DE+EC$, $AD-DC$ is greater than $AD-(DE+EC)=AE-EC$; much more therefore is $AD-DC$ greater than $AB-BC$. Therefore $AD-DC$ cannot be equal to $AB-BC$.

Prop. II.

Plate CLIX.

Every tranſverſe diameter of an hyperbola is biſected in the centre.

Fig. 42. Let Pp be a tranſverſe diameter, it is biſected in C; for if Cp be not equal to CP, take CQ equal to CP; from the points P, p, Q draw ſtraight lines to F and f the foci; draw fD perpendicular to Cp, and FE parallel to PD, meeting fD in E; join Ep, EQ. Becauſe $fC=CF$, and CD is parallel to EF, $fD=DE$ (2. 6. E.). Now pD is common to the triangles fDp, EDp, and the angles at D are equal, being right angles, therefore the triangles are equal, and $pf=pE$. In like manner it appears that $Qf=QE$. Again, the triangles FCP, fCQ having $FC=Cf$, $PC=CQ$, and the angles at C equal, are in all reſpects equal, therefore $FP=fQ$. In like manner it appears that $Pf=QF$, therefore $FQ-fQ$ is equal to $fP-FP$, or (Def. 1.) to $Fp-fp$; that is, $FQ-QE$ is equal to $Fp-pE$, which by the preceding lemma is abſurd; therefore $CP=Cp$.

Cor. 1. Every tranſverſe diameter meets the oppoſite hyperbolas each in one point only, and being produced falls within them.

Cor. 2. Every tranſverſe diameter divides the oppoſite hyperbolas into parts which are equal and ſimilar; the like parts of the curve being at oppoſite extremities of the diameter, and on contrary ſides of it.

Prop. III.

The ſquare of half the conjugate axis of an hyperbola is equal to the rectangle contained by the ſtraight lines between either focus and the extremities of the tranſverſe axis.

Plate CLVIII.

Fig. 39.

DRAW a ſtraight line from a, either of the extremities of the tranſverſe axis, to B, either of the extremities of the conjugate axis.

Then $BC^2+Ca^2=Ba^2=Cf^2$ (Def. 7.)

But becauſe Aa is biſected at C, and produced to f,

$Cf^2=Af\cdot fa+Ca^2$ (6. 2. E.)
therefore $BC^2+Ca^2=Af\cdot fa+Ca^2$,
and $BC^2=Af\cdot fa$.

PROP. IV.

The ſtraight line which biſects the angle contained by two ſtraight lines drawn from any point in the hyperbola to the foci is a tangent to the curve at that point.

Plate CLIX. Fig. 43.

LET D be any point in the curve, let DF, Df be ſtraight lines drawn to the foci, the ſtraight line DE which biſects the angle fDF is a tangent to the curve.

Take H any other point in DE, take $DG=Df$, and join Hf, HF, HG, fG; let fG meet DE in I. Becauſe $Df=DG$ and DI is common to the triangles DfI, DGI, and the angles fDI, GDI are equal, theſe triangles are equal, and $fI=IG$, and hence $fH=HG$ (4. 1. E.), ſo that $FH-fH=FH-HG$: but ſince FH is leſs than $FG+GH$, $FH-HG$ is leſs than FG, that is leſs than $FD-fD$ or Aa, therefore $FH-fH$ is leſs than Aa; hence the point H is without the hyperbola (2 cor. 1.), and conſequently DHI is a tangent to the curve at D (Def. 10.).

COR. 1. There cannot be more than one tangent to the hyperbola at the ſame point. For D is ſuch a point in the line DE, that the difference of the lines DF, Df, the diſtances of that point from the foci, is evidently greater than the difference of FH, fH the the diſtances of H any other point in that line; and if another line KD be drawn through D, there is in like manner a point K in that line, which will be different from D, ſuch, that the difference of FK, fK is greater than the difference of the diſtances of any other point in KD, and therefore greater than $FD-fD$, therefore the point K will be within the hyperbola (2 cor 1.), and the line KD will cut the curve.

COR. 2. A perpendicular to the tranſverſe axis at either of its extremities is a tangent to the curve. The demonſtration is the ſame as for the propoſition, if it be conſidered that when D falls at either extremity of the axis, the point I falls alſo at the extremity of the axis, and thus the tangent DE, which is always perpendicular to fI, is perpendicular to the axis.

COR. 3. Every tangent to either of the oppoſite hyperbolas paſſes between that hyperbola and the centre. Let the tangent DI meet the axis in E. Becauſe DE biſects the angle FDf,

$FD : fD :: FE : fE$ (3. 6. E.)

But FD is greater than fD (Def. 1.), therefore FE is greater than fE, and hence E is between C and the vertex of the hyperbola to which DE is a tangent.

SCHOLIUM.

From the property of the hyperbola which forms this propoſition, the points F and f are called *Foci*. For rays of light proceeding from one focus, and falling upon a poliſhed ſurface whoſe figure is that formed by the revolution of the curve about the tranſverſe axis, are reflected in lines paſſing through the other focus.

PROP. V.

The tangents at the vertices of any tranſverſe diameter of an hyperbola are parallel.

Fig. 44.

LET Pp be a diameter, HP, hp tangents at its vertices; draw ſtraight lines from P and p to F and f the foci. The triangles FCP, fCp, having $FC=fC$, $CP=Cp$ (2.), and the angles at C equal, are in all reſpects equal, and becauſe the angle FPC is equal to Cpf, FP is parallel to fp (27. 1. E.), therefore Pf is equal and parallel to pF (33. 1. E.): thus FPfp is a parallelogram of which the oppoſite angles P and p are equal (34. 1. E.); now the angles FPH, fph are the halves of theſe angles (4.); therefore the angles FPH, fph, and hence CPH, Cph, are alſo equal, and conſequently HP is parallel to hp.

COR. 1. If tangents be drawn to an hyperbola at the vertices of a tranſverſe diameter, ſtraight lines drawn from either focus to the points of contact make equal angles with theſe tangents. For the angle Fph is equal to FPH.

COR. 2. The tranſverſe axis is the only diameter which is perpendicular to tangents at its vertices. For let Pp be any other diameter. The angle CPH is leſs than FPH, that is, leſs than the half of FPf, therefore CPH is leſs than a right angle.

PROP. VI.

A ſtraight line drawn from either focus of an hyperbola to the interſection of two tangents to the curve, will make equal angles with ſtraight lines drawn from the ſame focus to the points of contact.

Fig. 45 and 46.

LET HP, Hp be tangents to an hyperbola at the points P, p; let a ſtraight line be drawn from H their interſection to F either of the foci; and let FP, Fp be drawn to the points of contact; the lines PF, pF make equal angles with HF.

Draw Pf, pf to the other focus. In PF and pF take $PK=Pf$, and $pk=pf$; join HK, Hk, and let fK, fk be drawn, meeting the tangents in G and g. The triangles fPH, KPH have $Pf=PK$, by conſtruction, and PH common to both, alſo the angle fPH equal to KPH (4.); therefore fH is equal to KH. In like manner it may be ſhewn that fH is equal to kH, therefore HK is equal to Hk; now FK is equal to Fk, for each is equal to the difference between FP and fP, or Fp and fp, that is, to the tranſverſe axis; therefore the triangles FKH, FkH are in all reſpects equal, and hence the angle KFH is equal to kFH, therefore PF and pF make equal angles with HF.

Prop. VII.

Two tangents to an hyperbola, or oppoſite hyperbolas, which are limited by their mutual interſection and the points in which they touch the curve, are to each other, reciprocally, as the ſines of the angles they contain with ſtraight lines drawn from the points of contact to either focus.

Fig. 47 and 48. Let HP, H*p*, which interſect each other at H, be tangents to an hyperbola, or oppoſite hyperbolas, at the points P, *p*; and let PF, *p*F be drawn to either focus,

HP : H*p* :: ſine H*p*F : ſine HPF.

Join HF, and in FP take FQ equal to F*p*, and join HQ; then, the angles at F being equal (6.), the triangles HFQ, HF*p* are equal, therefore HQ is equal to H*p*, and the angle HQF is equal to H*p*F. Now in the triangle HPQ,

HP : HQ :: ſine HQP, or ſine HQF : ſine HPF (Trig.)
therefore HP : H*p* :: ſine H*p*F : ſine HPF.

Lemma II.

Fig. 49. Let KL*l* be a triangle, having its baſe L*l* biſected at *p*, and let H*h*, any ſtraight line parallel to the baſe, and terminated by the ſides produced, be biſected at P, then P, *p* the point of biſection, and K the vertex of the triangle, are in the ſame ſtraight line, and that line biſects D*d* any other line parallel to the baſe.

Join KP, K*p*. The triangles KH*h*, KL*l* being ſimilar, and H*h*, L*l* ſimilarly divided at P, *p*,

KH : KL :: (H*h* : L*l* ::) HP : L*p*.

Now the angles at H and L are equal, therefore the triangles KHP, KL*p* are ſimilar, and the angle PKH is equal to *p*KL; to both add the angle HK*p*, and the angles PKH, HK*p* are equal to *p*KL, HK*p*, that is, to two right angles; therefore KP, K*p* lie in the ſame ſtraight line (14. 1. E.)

Next let D*d* meet K*p* in E, then

HP : DE (:: PK : EK) :: P*h* : E*d*,
therefore DE is equal to E*d*.

Prop. VIII.

Any ſtraight line terminated both ways by an hyperbola, and parallel to a tangent, is biſected by the tranſverſe diameter produced, that paſſes through the point of contact, or is an ordinate to that diameter.

Fig. 50. The ſtraight line D*d*, terminated by the hyperbola, and parallel to the tangent HP*h*, is biſected at E by P*p* the tranſverſe diameter produced, which paſſes through P, the point of contact.

Let L*pl* be a tangent at the other extremity of the diameter, and let KD, K*d*, tangents at the points D, *d*, meet the parallel tangents HP*h*, L*pl* in the points H, L, *h*, *l*, and draw DF, *d*F, PF to either focus. Becauſe H*h* is parallel to D*d*,

HD : *hd* :: KD : K*d*.

But KD, K*d* being tangents to the hyperbola,

ſine *hd*F : ſine HDF :: KD : K*d* (7.)
therefore ſine *hd*F : ſine HDF :: HD : *hd*,
now, ſine *h*PF : ſine *hd*F :: *hd* : *h*P (7.)
therefore, (23. 5. E.) ſine *h*PF : ſine HDF :: HD : *h*P;

but ſine HPF or ſine *h*PF : ſine HDF :: HD : HP, therefore the ratio of HD to *h*P is the ſame as the ratio of HD to HP, wherefore PH=P*h*. In the ſame manner it may be demonſtrated that *p*L=*pl*, therefore (lemma 2.) the diameter P*p* when produced paſſes through K, and biſects D*d*, which is parallel to H*h*, or L*l*, at E.

Cor. 1. Straight lines which touch an hyperbola at the extremities of an ordinate to any tranſverſe diameter, interſect each other in that diameter.

Cor. 2. Every ordinate to a tranſverſe diameter it parallel to a tangent at its vertex. For, if not, let a tangent be drawn parallel to the ordinate, then the diameter drawn through the point of contact would biſect the ordinate, and thus the ſame line would be biſected in two different points, which is abſurd.

Cor. 3. All the ordinates to the ſame tranſverſe diameter are parallel to each other.

Cor. 4. A ſtraight line that biſects two parallel chords, and terminates in the oppoſite hyperbola, is a tranſverſe diameter.

Cor. 5. The ordinates to the tranſverſe axis are perpendicular to it, and no other tranſverſe diameter has its ordinates perpendicular to it. This follows from 2. cor. 4. and 2. cor. 5.

Cor. 6. the tranſverſe axis, indefinitely produced, divides each of the oppoſite hyperbolas into two parts which are ſimilar to one another.

Prop. IX.

If a tangent to an hyperbola meet a tranſverſe diameter, and from the point of contact an ordinate be drawn to that diameter, the ſemidiameter will be a mean proportional between the ſegments of the diameter intercepted between the centre and the ordinate, and between the centre and the tangent.

Let DK a tangent to the curve at D meet the tranſverſe diameter P*p* in K, and let DE*d* be an ordinate to that diameter, Fig. 50.

Then CE : CP :: CP : CK.

Through P and *p*, the vertices of the diameter, draw the tangents PH and *p*L, meeting KD in H and L, theſe tangents are parallel to each other (5.), and to DE, the ordinate, by laſt propoſition. Draw PF, *p*F, DF to either of the foci. Then,

DH : HP :: ſine HPF : ſine HDF,
and DL : L*p* :: ſine L*p*F : ſine LDF, or ſine HDF } (7.)

Now the angles HPF, L*p*F are equal (1. cor. 5.);

therefore,

$$DH : PH :: DL : pL,$$

and by alternation

$$DH : DL :: PH : pL;$$

therefore, becauſe of the parallel lines PH, ED, pL,

$$EP : Ep :: PK : pK.$$

Take $CG=CE$, then $PG=Ep$, and by compoſition

$$EG : EP :: Pp : PK,$$

and taking the halves of the antecedents

$$CE : EP :: CP : PK;$$

hence, by diviſion, $CE : CP :: CP : CK$.

Cor. 1. The rectangle contained by PE and Ep is equal to the rectangle contained by KE and CE.

For $CP^2=KC\cdot CE=EC^2-KE\cdot EC$ (2. 2. E.)
alſo $CP^2=EC^2-PE\cdot Ep$ (6. 2. E.)
therefore $EC^2-KE\cdot EC=EC^2-PE\cdot Ep$,
and $KE\cdot EC=PE\cdot Ep$.

Cor. 2. The rectangle contained by PK and Kp is equal to the rectangle contained by KE and KC.

For $KC^2=CP^2-PK\cdot Kp$ (5. 2. E.)
alſo $KC^2=EC\cdot KC-EK\cdot KC=CP^2-EK\cdot KC$ (3. 2. E. and by the prop.)
therefore $CP^2-PK\cdot Kp=CP^2-EK\cdot KC$,
and $PK\cdot Kp=EK\cdot KC$.

Prop. X.

If a tangent to an hyperbola meet the conjugate axis, and from the point of contact a perpendicular be drawn to that axis, the ſemiaxis will be a mean proportional between the ſegments of the axis intercepted between the centre and the perpendicular, and between the centre and the tangent.

Fig. 51. Let DH, a tangent to the hyperbola at D, meet the conjugate axis Bb in H, and let DG be perpendicular to that axis, then

$$CG : CB :: CB : CH.$$

Let DH meet the tranſverſe axis in K, draw DE perpendicular to that axis, draw DF, Df to the foci, and deſcribe a circle about the triangle DfF; the conjugate axis will evidently paſs through the centre of the circle, and becauſe the angle FDf is biſected by the tangent DK, the line DK will paſs through one extremity of the diameter; therefore the circle paſſes through H. Draw DL to the other extremity of the diameter. The triangles LGD, KCH, are ſimilar, for each is ſimilar to the right-angled triangle LDH, therefore,

$LG : GD\ (=CE) :: CK : CH;$
hence $LG\cdot CH=CE\cdot CK=$ (by laſt prop.) CA^2.
Now $LC\cdot CH=CF^2$ (35. 3. E.)
therefore $LC\cdot CH-LG\cdot CH=CF^2-CA^2$,
that is, $CG\cdot CH=CB^2$ (Def. 7.)
wherefore $CG : CB :: CB : CH$.

Definition.

Fig. 52. XI. If through A, one of the vertices of the tranſverſe axis, a ſtraight line HAh be drawn, equal and parallel to Bb the conjugate axis, and biſected at A by the tranſverſe axis, the ſtraight lines CHM, Chm drawn through the centre, and the extremities of that parallel, are called *Aſymptotes*.

Cor. 1. The aſymptotes of two oppoſite hyperbolas are common to both. Through a, the other extremity of the axis, draw H′ah', parallel to Bb, and meeting the aſymptotes of the hyperbola DAD in H′ and h'. Becauſe aC is equal to AC, aH′ is equal to Ah, or to BC; alſo ah' is equal to AH, or to BC; hence, by the definition, CH′ and Ch' are aſymptotes of the oppoſite hyperbola dad.

Cor. 2. The aſymptotes are diagonals of a rectangle formed by drawing perpendiculars to the axes at their vertices. For the lines AH, CB, aH′ being equal and parallel, the points H, B, H′ are in a ſtraight line paſſing through B parallel to Aa; the ſame is true of the points h, b, h'.

Prop. XI.

The aſymptotes do not meet the hyperbola; and if from any point in the curve a ſtraight line be drawn parallel to the conjugate axis, and terminated by the aſymptotes, the rectangle contained by its ſegments from that point is equal to the ſquare of half that axis.

Through D any point in the hyperbola draw a Fig. 53. ſtraight line parallel to the conjugate axis, meeting the tranſverſe axis in E, and the aſymptotes in M and m; the points M and m ſhall be without the hyperbola, and the rectangle MD·Dm is equal to the ſquare of BC.

Draw DG perpendicular to Bb the conjugate axis, let a tangent to the curve at D meet the tranſverſe axis in K, and the conjugate axis in L, and let a perpendicular at the vertex A meet the aſymptote in H. Becauſe DK is a tangent, and DE an ordinate to the axis, CA is a mean proportional between CK and CE (9.), and therefore

$CK : CE :: CA^2 : CE^2$ (2 cor. 20. 6. E.)
But $CK : CE :: LC : LG$,
and $CA^2 : CE^2 :: AH^2 : EM^2$;
therefore $LC : LG :: AH^2 : EM^2$.

Again, CB being a mean proportional between CL and CG (10.)

$$LC : CG :: CB^2 : CG^2,$$

and therefore

$LC : LG :: CB^2 :: CB^2+CG^2$, or CB^2+ED^2;
wherefore $AH^2 : EM^2 :: CB^2 : CB^2+ED^2$.
Now $AH^2=CB^2$ (Def. 11.)
therefore $EM^2=CB^2+ED^2$,

conſequently EM^2 is greater than ED^2, and EM greater than ED, therefore M is without the hyperbola. In like manner it appears that m is without the hyperbola; therefore every point in both the aſymptotes is without the hyperbola. Again, the ſtraight line Mm terminated by the aſymptotes, being manifeſtly biſected by the axis at E,

$$ME^2 = MD \cdot Dm + DE^2;$$

but it has been ſhewn that

$$ME^2 = BC^2 + DE^2,$$

therefore $MD \cdot Dm = BC^2$.

Cor. 1. Hence, if in a ſtraight line Mm, terminated by the aſymptotes, and parallel to the conjugate axis, there be taken a point D ſuch that the rectangle $MD \cdot Dm$ is equal to the ſquare of that axis, the point D is in the hyperbola.

Cor. 2. If ſtraight lines MDm, NRn, be drawn through D and R, any points in the hyperbola, or oppoſite hyperbolas, parallel to the conjugate axis, and meeting the aſymptotes in M, m, and N, n, the rectangles $MD \cdot Dm$, $NR \cdot Rn$ are equal.

Prop. XII.

The hyperbola and its aſymptote when produced continually approach to each other, and the diſtance between them becomes leſs than any given line.

Fig. 53. Take two points E and O in the tranſverſe axis produced, and through theſe points draw ſtraight lines parallel to the conjugate axis, meeting the hyperbola in D, R, and the aſymptotes in M, m and N, n.

Becauſe NO^2 is greater than ME^2,
and $NR \cdot Rn = MD \cdot Dm$, (2 cor. 11.)
therefore $NO^2 - NR \cdot Rn$ is greater than $ME^2 - MD \cdot Dm$,
that is RO^2 is greater than DE^2,
and RO is greater than DE;
now On is greater than Em,
therefore Rn is greater than Dm,
and ſince $Rn : Dm :: DM : RN$, (2. Cor. 11.)
DM is greater than RN,

therefore the point R is nearer to the aſymptote than D, that is, the hyperbola when produced approaches to the aſymptote.

Let S be any line leſs than half the conjugate axis; then, becauſe Dm, a ſtraight line drawn from a point in the hyperbola, parallel to the conjugate axis, and terminated by the aſymptote on the other ſide of the tranſverſe axis, may evidently be of any magnitude greater than Ah, which is equal to half the conjugate axis, Dm may be a third proportional to S and BC; and ſince Dm is alſo a third proportional to DM (the ſegment between D and the other aſymptote) and BC, DM may be equal to S; but the diſtance of D from the aſymptote is leſs than DM, therefore that diſtance may become leſs than S, and conſequently leſs than any given line.

Cor. Every ſtraight line paſſing through the centre, within the angles contained by the aſymptotes through which the tranſverſe axis paſſes, meets the hyperbola, and therefore is a tranſverſe diameter; and every ſtraight line paſſing through the centre within the adjacent angles falls entirely without the hyperbola.

Scholium.

The name *aſymptotes (non concurrentes)* has been given to the lines CH, Ch, becauſe of the property they have of continually approaching to the hyperbola without meeting it, as has been proved in this propoſition.

Prop. XIII.

If from two points in a hyperbola, or oppoſite hyperbolas, two parallel ſtraight lines be drawn to meet the aſymptotes, the rectangles contained by their ſegments between the points and the aſymptotes are equal. Plate CLX.

Let D and G be two points in the hyperbola, or oppoſite hyperbolas, let parallel lines EDe, HGh be drawn to meet the aſymptotes in E, e, and H, h, the rectangles $ED \cdot De$, $HG \cdot GH$ are equal. Fig. 54. and 55.

Through D and G draw ſtraight lines parallel to the conjugate axis, meeting the aſymptotes in the points L, l, and M, m. The triangles HGM, EDL are ſimilar, as alſo the triangles hGm, eDl,

$$\text{therefore } DL : DE :: GM : GH,$$
$$\text{and } Dl : De :: Gm : Gh;$$

hence, taking the rectangles of the correſponding terms of the proportions,

$$LD \cdot Dl : ED \cdot De :: MG \cdot Gm : HG \cdot Gh.$$
But $LD \cdot Dl = MG \cdot Gm$ (2. Cor. 11.)
therefore $ED \cdot De = HG \cdot Gh$.

Cor. 1. If a ſtraight line be drawn through D, d, two points in the ſame or oppoſite hyberbolas, the ſegments DE, de between thoſe points and the aſymptotes are equal. For in the ſame manner that the rectangles $ED \cdot De$, $HG \cdot Gh$ have been proved to be equal, it may be ſhewn that the rectangles $Ed \cdot de$, $HG \cdot Gh$ are equal, therefore $ED \cdot De = Ed \cdot de$. Let Ee be biſected in O, then $ED \cdot De = EO^2 - OD^2$ and $Ed \cdot de = EO^2 - Od^2$, therefore $EO^2 - OD^2 = EO^2 - Od^2$; hence $OD = Od$, and $ED = ed$. Fig. 54. and 55.

Cor. 2. When the points D and d are in the ſame hyperbola, by ſuppoſing them to approach till they coincide at P, the line Ee will thus become a tangent to the curve at P. Therefore any tangent KPk, which is terminated by the aſymptotes, is biſected at P, the point of contact. Fig. 54.

Cor. 3. And if any ſtraight line KPk, limited by the aſymptotes, be biſected at P a point in the curve, that line is tangent at P. For it is evident that only one line can be drawn through P which ſhall be limited by the aſymptotes, and biſected at P. Fig. 54.

Cor. 4. If a ſtraight line be drawn through D, any point in the hyperbola, parallel to a tangent KPk, and terminated by the aſymptotes at E and e, the rectangle $ED \cdot De$ is equal to the ſquare of PK, the ſegment of the tangent between the point of contact and either aſymptote. The demonſtration is the ſame as in the propoſition. Fig. 54.

Cor. 5. If from any point D in a hyperbola a ſtraight line be drawn parallel to Pp any diameter, meeting the aſymptotes in E and e, the rectangle $ED \cdot De$ is equal to the ſquare of half the diameter. The demonſtration is the ſame as in the propoſition. Fig. 55.

Prop. XIV.

If two ſtraight lines be drawn from any point in an hyperbola to the aſymptotes, and from any other point in the ſame, or oppoſite hyperbolas, two other lines be drawn parallel to the former, the rectangle contained by the firſt two lines will be equal to the rectangle contained by the other two lines.

Fig. 56. From D any point in the hyperbola draw DH and DK to the aſymptotes, and from any other point d draw dh and dk parallel to DH and DK. The rectangles $HD \cdot DK$, $hd \cdot dk$ are equal.

Join D, d meeting the aſymptotes in E, e. From ſimilar triangles

$$ED : DH :: Ed : dh,$$
$$\text{and } eD : DK :: ed : dk,$$

therefore, taking the rectangles of correſponding terms,

$$ED \cdot De : HD \cdot DK :: Ed \cdot de : hd \cdot dk;$$
$$\text{but } ED \cdot De = Ed \cdot de \ (13.),$$
$$\text{therefore } HD \cdot DK = hd \cdot dk.$$

Cor. 1. If the lines $D'K'$, $D'H'$, $d'k'$, $d'h'$, be parallel to the aſymptotes, and thus form the parallelograms $D'K'CH'$, $d'k'Ch'$, theſe are equal to one another (16. and 14. 6. E.) And if $D'C$, $d'C$ be joined, the halves of the parallelograms, or the triangles $D'K'C$, $d'k'C$ are alſo equal.

Cor. 2. If from D', d', any two points in an hyperbola, ſtraight lines $D'K'$, $d'k'$ be drawn parallel to one aſymptote, meeting the other in K' and k', theſe lines are to each other reciprocally as their diſtances from the centre, or $D'K' : d'k' :: Ck' : CK'$. This appears from laſt cor. and 14. 6. E.

Definitions.

Fig. 57. XII. If Aa be the tranſverſe axis, and Bb the conjugate axis of two oppoſite hyperbolas DAD, dad, and if Bb be the tranſverſe axis, and Aa the conjugate axis of other two oppoſite hyperbolas EBE, ebe, theſe hyperbolas are ſaid to be *conjugate to the former*. When all the four hyperbolas are mentioned they are called *conjugate hyperbolas*.

Cor. The aſymptotes of the hyperbolas DAD, dad are alſo the aſymptotes of the hyperbolas EBE, ebe. This is evident from Cor. 2. to Definition 11.

XIII. Any diameter of the conjugate hyperbolas is called a *ſecond diameter of the other hyperbolas*.

Cor. Every ſtraight line paſſing through the centre, within the angle through which the conjugate or ſecond axis paſſes, is a ſecond diameter of the hyperbola.

XIV. Any ſtraight line not paſſing through the centre, but terminated both ways by the oppoſite hyperbolas, and biſected by a ſecond diameter, is called an *Ordinate to that diameter*.

Prop. XV.

Any ſtraight line not paſſing through the centre, but terminated by the oppoſite hyperbolas, and parallel to a tangent to either of the conjugate hyperbolas, is biſected by the ſecond diameter that paſſes through the point of contact, or is an ordinate to that diameter.

Fig. 58. The ſtraight line Dd terminated by the oppoſite hyperbolas, and parallel to the tangent KQk, is biſected at E by Qq the diameter that paſſes through the point of contact.

Let Dd meet the aſymptotes in G and g, and let the tangent meet them in K and k. The ſtraight lines Gg, Kk are evidently ſimilarly divided at E and Q, and ſince $KQ = Qk$ (2 cor. 13.) therefore $GE = Eg$; now $DG = gd$ (1 cor. 13.), therefore $DE = Ed$.

Cor. 1. Every ordinate to a ſecond diameter is parallel to a tangent at its vertex. The demonſtration is the ſame as in Cor. 2. Prop.

Cor. 2. All the ordinates to the ſame ſecond diameter are parallel to each other.

Cor. 4. A ſtraight line that biſects two parallel ſtraight lines which terminate in the oppoſite hyperbolas is a ſecond diameter.

Cor. 5. The ordinates to the conjugate or ſecond axis are perpendicular to it, and no other ſecond diameter is perpendicular to its ordinates.

Cor. 6. The oppoſite hyperbolas are ſimilar to one another, and like portions of them are, in all reſpects, equal.

Prop. XVI.

If a tranſverſe diameter of an hyperbola be parallel to the ordinates to a ſecond diameter, the latter ſhall be parallel to the ordinates to the former.

Fig. 59. Let Pp, a tranſverſe diameter of an hyperbola, be parallel to DEd, any ordinate to the ſecond diameter Qq, the ſecond diameter Qq ſhall be parallel to the ordinates to the diameter Pp.

Draw the diameter dCG through one extremity of the ordinate dD, and join G and D, the other extremity, meeting Pp in H. Becauſe dG is biſected at C, and CH is parallel to dD, the line DG is biſected at H, therefore DG is an ordinate to the diameter Pp. And becauſe dG and dD are biſected at C and E, the diameter Qq is parallel to DG (2. 6. E.), therefore Qq is parallel to any ordinate to the diameter Pp.

Definitions.

XV. Two diameters are ſaid to be *conjugate to one another* when each is parallel to the ordinates to the other diameter.

Cor. Diameters which are conjugate to one another are parallel to tangents at the vertices of each other.

XVI. A third proportional to any diameter and its conjugate is called the *Parameter*, alſo the *Latus rectum of that diameter*.

Prop. XVII.

The tangent at the vertex of any tranſverſe diameter of an hyperbola, which is terminated by the aſymptotes, is equal to the diameter that is conjugate to that diameter.

Fig. 60. Let PCp be any tranſverſe diameter of an hyperbola, HPh a tangent at its vertex, meeting the aſymptotes in H and h, and $Q q$ the diameter which is conjugate to $P p$; the tangent $H h$ is equal to the diameter $Q q$.

Through D, any point in the hyperbola, draw a ſtraight line parallel to the tangent and diameter, cutting either of the conjugate hyperbolas in d, and the aſymptotes in E and e, and through D and d draw lines parallel to $B b$ the conjugate axis, meeting the aſymptotes in the points K, k, and L, l. The triangles DEK, dEL are ſimilar, as alſo $e D k$, $e d l$, therefore

$$KD : DE :: Ld : dE,$$
$$\text{and } kD : De :: ld : de;$$

therefore, taking the rectangles of the correſponding terms,

$$KD \cdot Dk : ED \cdot De :: Ld \cdot dl : Ed \cdot de.$$

But $KD \cdot Dk = BC^2$ (11.) and $BC^2 = Ld \cdot dl$ (5 cor. 13.)

therefore $ED \cdot De = Ed \cdot de$.

Now $ED \cdot De = HP^2$ (4 cor. 13.),

and $Ed \cdot de = QC^2$ (5 cor. 13.)

therefore $HP^2 = QC^2$, and $HP = QC$,

and conſequently $Hh = Qq$.

Cor. 1. If another tangent be drawn to the curve at p, meeting the aſymptotes in H' and h', the ſtraight lines which join the points H, H', alſo h, h', are tangents to the conjugate hyperbolas at Q and q. For $p H'$ as well as PH is equal and parallel to CQ, therefore the points H, Q, H' are in a ſtraight line parallel to $P p$, and $HQ = H'Q$ (33. 1. E.), therefore HQH' is a tangent to the curve at Q. In like manner it appears that $h q h'$ is a tangent at q.

Cor. 2. If tangents be drawn at the vertices of two conjugate diameters, they will meet in the aſymptotes, and form a parallelogram of which the aſymptotes are diagonals.

Prop. XVIII.

If a tangent to an hyperbola meet a ſecond diameter, and from the point of contact an ordinate be drawn to that diameter, half the ſecond diameter will be a mean proportional between the ſegments of the diameter intercepted between the centre and the ordinate, and between the centre and the tangent.

Fig. 61.

Let DL a tangent to the curve at D meet the ſecond diameter $Q q$ in L, and let DGd be an ordinate to that diameter, then

$$CG : CQ :: CQ : CL.$$

Let $P p$ be the diameter that is conjugate to $Q q$, let HPh be a tangent at the vertex, terminated by the aſymptotes; through D draw the ordinate DEd to the diameter $P p$, meeting the aſymptotes in M and m; let K be the interſection of DL and $P p$. Becauſe DK is a tangent at D, and DEd an ordinate to $P p$, CP is a mean proportional between CE and CK (9.) and therefore

$$CE^2 : CP^2 :: CE : CK.$$

Now, the lines CQ, PH, EM being parallel (8. and Def. 15.), from ſimilar triangles,

$$CE^2 : CP^2 :: EM^2 : PH^2,$$
$$\text{and } CE, \text{ or } DG : CK :: LG : LC;$$
$$\text{therefore } EM^2 : PH^2 :: LG : LC,$$
$$\text{and by diviſion, \&c. } EM^2 - PH^2 : PH^2 :: CG : LC :: CG^2 : CG \cdot LC.$$
$$\text{But ſince } PH^2 = MD \cdot Dm \text{ (4 cor. 13.)}, EM^2 - PH^2 = ED^2 = CG^2,$$
$$\text{therefore } PH^2 = CG \cdot LC;$$
$$\text{wherefore, and ſince } PH = CQ \text{ (17.)}$$
$$CG : CQ :: CQ : CL.$$

Prop. XIX.

If an ordinate be drawn to any tranſverſe diameter of an hyperbola, the rectangle under the abſciſſes of the diameter will be to the ſquare of the ſemi-ordinate as the ſquare of the diameter to the ſquare of its conjugate.

Fig. 62.

Let DEd be an ordinate to the tranſverſe diameter $P p$, and let $Q q$ be its conjugate diameter,

$$PE \cdot Ep : DE^2 :: Pp^2 : Qq^2.$$

Let DKL a tangent at D meet the diameter in K, and its conjugate in L. Draw DG parallel to $P p$, meeting $Q q$ in G. Becauſe CP is a mean proportional between CE and CK (9.)

$$CP^2 : CE^2 :: CK : CE,$$
$$\text{and by diviſion } CP^2 : PE \cdot Ep :: CK : KE.$$

But, becauſe ED is parallel to CL,

$$CK : KE :: CL : DE, \text{ or } CG,$$

and becauſe CQ is a mean proportional between CG and CL (18.)

$$CL : CG :: CQ^2 : CG^2, \text{ or } DE^2,$$
$$\text{therefore } CP^2 : PE \cdot Ep :: CQ^2 : DE^2,$$

and by inverſion and alternation,

$$PE \cdot Ep : DE^2 :: CP^2 : CQ^2 :: Pp^2 : Qq^2.$$

Cor. 1. If an ordinate be drawn to any ſecond diameter of an hyperbola, the ſum of the ſquares of half the ſecond diameter and its ſegment intercepted by the ordinate from the centre is to the ſquare of the ſemi-ordinate, as the ſquare of the ſecond diameter to the ſquare of its conjugate.

Let DG be a ſemi-ordinate to the ſecond diameter $Q q$. It has been ſhewn that

$$CG^2 : CQ^2 :: PE \cdot Ep : CP^2,$$

therefore, by comp.

$$CQ^2 + CG^2 : CQ^2 : CE^2 \text{ or } DG^2 : CP^2,$$

and by alter.

$$CQ^2 + CG^2 : CE^2 :: CQ^2 : CP^2 :: Qq^2 : Pp^2.$$

Cor. 2. The ſquares of ſemi-ordinates, and of ordinates to any tranſverſe diameter, are to one another as the rectangles contained by the correſponding abſciſſes; and the ſquares of ſemi-ordinates, and of ordinates to any ſecond diameter are to one another as the ſums of the ſquares of half that diameter and the ſegments intercepted by the ordinate from the centre.

Cor. 3. The ordinates to any tranſverſe diameter, which intercept equal ſegments of that diameter from the centre, are equal to one another, and, converſely, equal ordinates intercept equal ſegments of the diameter from the centre.

Prop. XX.

Plate CLXI. The tranſverſe axis of an hyperbola is the leaſt of all its tranſverſe diameters, and the conjugate axis is the leaſt of all its ſecond diameters.

Fig. 64. Let Rr be the tranſverſe axis, Pp any other tranſverſe diameter, draw PE perpendicular to Rr; then CE being greater than CR, and CP greater than CE, much more is CP greater than CR, therefore Pp is greater than Rr. In like manner it is ſhewn that if Ss be the conjugate axis, and Qq any other ſecond diameter, Qq is greater than Ss.

Prop. XXI.

Plate CLX. If an ordinate be drawn to any tranſverſe diameter of an hyperbola, the rectangle under the abſciſſes of the diameter is to the ſquare of the ſemi-ordinate as the diameter to its parameter.

Fig. 63. Let DE be a ſemi-ordinate to the tranſverſe diameter Pp; let PG be the parameter of the diameter, and Qq the conjugate diameter. By the definition of the parameter (Def. 16.)

$$Pp : Qq :: Qq : PG,$$

therefore $Pp : PG :: Pp^2 : Qq^2$, (2 cor. 20. 6. E.)

But $Pp^2 : Qq^2 :: PE \cdot Ep : DE^2$, (19.)

therefore $PE \cdot Ep : DE^2 :: Pp : PG$.

Cor. Let the parameter PG be perpendicular to the diameter Pp; join pG, and from E draw EM parallel to PG, meeting pG in M. The ſquare of DE the ſemi-ordinate is equal to the rectangle contained by PE and EM.

For $PE \cdot Ep : DE^2 :: Pp : PG$,

and $Pp : PG :: Ep : EM :: PE \cdot Ep : PE \cdot EM$,

therefore $DE^2 = PE \cdot EM$.

Scholium.

If the rectangles $PGLp$, HGKM be completed, it will appear that the ſquare of ED is equal to the rectangle MP, which rectangle is greater than the rectangle KP, contained by the abſciſs PE, and the parameter GP, by a rectangle KH ſimilar and ſimilarly ſituated to LP, the rectangle contained by the parameter and diameter. It was on account of the exceſs of the ſquare of the ordinate above the rectangle contained by the abſciſs and parameter that Apollonius gave the curve to which the property belonged the name of Hyperbola.

Prop. XXII.

Plate CLXI. If from the vertices of two conjugate diameters of an hyperbola there be drawn ordinates to any third tranſverſe diameter, the ſquare of the ſegment of that diameter, intercepted between the ordinate from the vertex of the ſecond diameter, and the centre, is equal to the rectangle contained by the ſegments between the other ordinate and the vertices of the third tranſverſe diameter. And the ſquare of the ſegment intercepted between the ordinate from the vertex of the tranſverſe diameter and the centre is equal to the ſquare of the ſegment between the other ordinate, and the centre, together with the ſquare of half the third tranſverſe diameter.

Fig. 64. Let Pp, Qq be two conjugate diameters, of which Pp is a tranſverſe, and Qq a ſecond diameter; let PE, QG be ſemi-ordinates to any third tranſverſe diameter Rr, then $CG^2 = RE \cdot Er$, and $CE^2 = CG^2 + CR^2$.

Draw the tangents PH, QK, meeting Rr in H and K. The rectangles $HC \cdot CE$ and $KC \cdot CG$ are equal, for each is equal to CR^2 (9.) therefore,

$$HC : CK :: CG : CE.$$

But the triangles HPC, CQK are evidently ſimilar (cor. Def. 15.) and ſince PE, QG are parallel, their baſes CH, KC ſimilarly divided at E and G, therefore

$$HC : CK :: HE : CG,$$

wherefore $CG : CE :: HE : CG$,

conſequently $CG^2 = CE \cdot EH =$ (1 cor. 9.) $RE \cdot Er$.

Again, from the ſimilar triangles HPC, CQK,

$$HC : CK :: CE : KG.$$

Now it was ſhewn that $HC : CK :: CG : CE$,

therefore $CG : CE :: CE : KG$,

conſequently

$CE^2 = CG \cdot GK =$ (3. 2. E.) $CG^2 + GC \cdot CK$.

But $GC \cdot CK = CR^2$ (18.)

therefore $CE^2 = CG^2 + CR^2$.

Cor. 1. Let Ss be the diameter that is conjugate to Rr, then Rr is to Ss as CG to PE, or as CE to QG.

For $Rr^2 : Ss^2 :: RE \cdot Er$, or $CG^2 : PE^2$,

therefore $Rr : Ss :: CG : PE$.

In like manner $Rr : Ss :: CE : QG$.

Cor. 2. The difference between the ſquares of CE, CG the ſegments of the tranſverſe diameter to which the ſemi-ordinates PE, QG are drawn, is equal to the ſquare of CR the ſemi-diameter. For it has been ſhewn that $CE^2 = CG^2 + CR^2$;

therefore $CE^2 - CG^2 = CR^2$.

Cor. 3. The difference of the ſquares of any two conjugate diameters is equal to the difference of the ſquares of the axes. Let Rr, Ss be the axes, and Pp, Qq any two conjugate diameters; draw PE, QG perpendicular to Rr, and PL, QM perpendicular to Ss. Then

$$CE^2 - CG^2 = CR^2,$$

and $CM^2 - CL^2$, or $GB^2 - PE^2 = CS^2$,

therefore $CE^2 + PE^2 - (CG^2 + GQ^2) = CR^2 - CS^2$,

that is (47. 1. E.) $CP^2 - CQ^2 = CR^2 - CS^2$,

therefore $Pp^2 - Qq^2 = Rr^2 - Ss^2$.

Prop. XXIII.

If four ſtraight lines be drawn touching conjugate hyperbolas at the vertices of any two conjugate diameters, the parallelogram formed by theſe lines is equal to the rectangle contained by the tranſverſe and conjugate axes.

Fig. 65. Let Pp, Qq be any two conjugate diameters, a parallelogram $DEGH$ formed by tangents to the conjugate hyperbolas at their vertices is equal to the rectangle contained by Aa, Bb the two axes.

Let Aa, one of the axes, meet the tangent PE in K; join QK, and draw PL, QM perpendicular to Aa.

Becauſe $CK : CA :: CA : CL$ (9.)
and $CA : CB :: CL : QM$ (1 cor. 22.)
ex aeq. $CK : CB :: CA : QM$,
therefore $CK \cdot QM = CB \cdot CA$.

But $CK \cdot QM$ = twice trian. CKQ = paral. $CPEQ$,
therefore the parallelogram $CPEQ = CB \cdot CA$;

and, taking the quadruples of theſe, the parallelogram $DEGH$ is equal to the rectangle contained by Aa and Bb.

Prop. XXIV.

If two tangents at the vertex of any tranſverſe diameter of an hyperbola meet a third tangent, the rectangle contained by their ſegments between the points of contact, and the points of interſection, is equal to the ſquare of the ſemi-diameter to which they are parallel. And the rectangle contained by the ſegments of the third tangent between its points of contact and the parallel tangents, is equal to the ſquare of the ſemi-diameter to which it is parallel.

Fig. 66. Let PH, ph, tangents at the vertices of a tranſverſe diameter Pp, meet DHh, a tangent to the curve at any point D, in H and h; let CQ be the ſemi-diameter to which the tangents PH, ph are parallel, and CR that to which Hh is parallel; then

$$PH \cdot ph = CQ^2, \text{ and } DH \cdot Dh = CR^2.$$

Let Hh meet the ſemi-diameters CP, CQ in L and K. Draw ED, RM parallel to CQ, and DG parallel to CP.

Becauſe $LP \cdot Lp = LE \cdot LC$ (2 cor. 9.)
$LP : LE :: LC : Lp$;

hence, and becauſe of the parallels PH, ED, CK, ph,

$PH : ED :: CK : ph$,
wherefore $PH \cdot ph = ED \cdot CK$.
But $ED \cdot CK = CG \cdot CK = CQ^2$ (18.)
therefore $PH \cdot ph = CQ^2$.

Again, the triangles LED, CMR are evidently ſimilar, and LE, LD are ſimilarly divided at H and P, alſo at h and p,

therefore $PE : HD :: (LE : LD ::) CM : CR$,
alſo $pE : hD :: (LE : LD ::) CM : CR$,

hence, taking the rectangles of the correſponding terms,

$$PE \cdot pE : HD \cdot hD :: CM^2 : CR^2.$$

But, if CD be joined, the points D and R are evidently the vertices of two conjugate diameters (cor. def. 15.) and therefore $PE \cdot pE = CM^2$ (22.)

therefore $HD \cdot hD = CR^2$.

Cor. The rectangle contained by LD and DK, the ſegments of a tangent intercepted between D the point of contact, and Pp, Qq, any two conjugate diameters, is equal to the ſquare of CR, the ſemi-diameter to which the tangent is parallel.

Let the parallel tangents PH, ph meet LK in H and h, and draw DE a ſemi-ordinate to Pp. Becauſe of the parallels ED, PH, CK, ph,

$LE : LD :: EP : DH$,
and $EC : DK :: Ep : Dh$,
therefore
$LE \cdot EC : LD \cdot DK :: EP \cdot Ep : DH \cdot Dh$.
But $LE \cdot EC = EP \cdot Ep$ (1 cor. 9.)
therefore $LD \cdot DK = DH \cdot Dh =$ (by this prop.) CR^2.

Prop. XXV.

If two ſtraight lines be drawn from the foci of an hyperbola perpendicular to a tangent, ſtraight lines drawn from the centre, to the points in which they meet the tangent, will each be equal to half the tranſverſe axis.

Let PdD be a tangent to the curve at P, and FD, fd perpendiculars to the tangent from the foci, the ſtraight lines joining the points C, D and C, d are each equal to AC, half the tranſverſe axis. Fig. 67.

Join FP, fP, and produce FD, Pf till they interſect in E. The triangles FDP, EDP have the angles at D right angles, and the angles FPD, EPD equal (4.) and the ſide DP common to both; they are therefore equal, and conſequently have $ED = DF$, and $EP = PF$, wherefore $Ef = FP - Pf = Aa$. Now the ſtraight lines FE, Ff being biſected at D and C, the line DC is parallel to Ef, and thus the triangles FfE, FCD are ſimilar,

therefore $Ff : fF$, or $Aa :: FC : CD$;

but FC is half Ff, therefore CD is half of Aa.

Cor. If a ſtraight line Qq be drawn through the centre parallel to the tangent Dd, it will cut off from PE, Pf the ſegments PG, Pg, each equal to AC half the tranſverſe axis. For $CdPG$, $CDPg$ are parallelograms, therefore $PG = dC = AC$, and $Pg = DC = AC$.

Prop. XXVI.

The rectangle contained by perpendiculars drawn from the foci of an hyperbola to a tangent is equal to the ſquare of half the conjugate axis.

Let PdD be a tangent, and FD, fd perpendiculars from the foci, the rectangle contained by FD and fd is equal to the ſquare of BC half the conjugate axis. Fig. 67.

It is evident from laſt propoſition that the points D, d are in the circumference of a circle, whoſe centre is

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is the centre of the hyperbola, and radius CA half the tranſverſe axis ; now FDd being a right angle, if d C be joined, and produced, it will meet DF in H, a point in the circumference; and ſince FC$=f$C, and CH$=$Cd, and the angles FCH, fCd are equal, FH is equal to fd, therefore,

$$DF \cdot df = DF \cdot FH = AF \cdot aF\ (36.\ 3.\ E) = CB^2\ (3.).$$

Cor. If PF, Pf be drawn from the point of contact to the foci, the ſquare of FD is a fourth proportional to fP, FP and CB². For the angles fPd, FPD are equal (4.) and FDP, fdP are right angles, therefore the triangles FDP, fdP are ſimilar, and

$$fP : FP :: fd : FD :: fd \cdot FD \text{ or } BC^2 : FD^2.$$

Prop. XXVII.

Fig. 68. If from C the centre of an hyperbola a ſtraight line CL be drawn perpendicular to a tangent LD, and from D the point of contact a perpendicular be drawn to the tangent, meeting the tranſverſe axis in H, and the conjugate axis in h, the rectangle contained by CL and DH is equal to the ſquare of CB, the ſemi-conjugate axis; and the rectangle contained by CL and Dh is equal to the ſquare of CA, the ſemi-tranſverſe axis.

Let the axes meet the tangent in M and m, and from D draw the ſemi-ordinates DE, De, which will be perpendicular to the axes.

The triangles DEH, CLm are evidently equiangular; therefore,

$$DH : DE :: Cm : CL,$$
$$\text{hence } CL \cdot DH = DE \cdot Cm,$$
$$\text{but } DE \cdot Cm \text{ or } Ce \cdot Cm = BC^2\ (10.)$$
$$\text{therefore } CL \cdot DH = BC^2.$$

In the ſame way it may be ſhewn that $CL \cdot Dh = AC^2$.

Cor. 1. If a perpendicular be drawn to a tangent at the point of contact, the ſegments intercepted between the point of contact and the axes are to each other reciprocally as the ſquares of the axes by which they are terminated.

$$\text{For } AC^2 : BC^2 :: CL \cdot Dh : CL \cdot DH :: Dh : DH.$$

Cor. 2. If DF be drawn to either focus, and HK be drawn perpendicular to DF; the ſtraight line DK ſhall be equal to half the parameter of the tranſverſe axis.

Draw CG parallel to the tangent at D, meeting DH in N, and DF in G. The triangles GDN, HDK are ſimilar, therefore

$$GD : DN :: HD : DK;$$
$$\text{and hence } GD \cdot DK = HD \cdot DN.$$
$$\text{But } GD = AC \text{ (cor. 25.) and } ND = CL,$$
$$\text{therefore } AC \cdot DK = HD \cdot CL = \text{ (by the prop.) } CB^2,$$
$$\text{wherefore } AC : BC :: BC : DK,$$
$$\text{hence DK is half the parameter of } Aa \text{ (def. 16.)}$$

Definition.

Fig. 69. XVII. If a point G be taken in the tranſverſe axis of an hyperbola, ſo that the diſtance of G from the centre may be a third proportional to CF, the diſtance of either focus from the centre, and CA the ſemi-tranſverſe axis, a ſtraight line HGh drawn through G, perpendicular to the axis, is called the *Directrix* of the hyperbola.

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Cor. 1. If MFm, an ordinate to the axis, be drawn through the focus, tangents to the hyperbola at the extremities of the ordinate will meet the axis at the point G (9.).

Cor. 2. The hyperbola has two directrices, for the point G may be taken on either ſide of the centre.

Prop. XXVIII.

The diſtance of any point in an hyperbola from either directrix is to its diſtance from the focus neareſt that directrix, in the conſtant ratio of the ſemi-tranſverſe axis to the diſtance of the focus from the centre.

Let D be any point in the hyperbola; let DK be drawn perpendicular to the directrix, and DF to the focus neareſt the directrix; DK is to DF as CA, half the tranſverſe axis, to CF, the diſtance of the focus from the centre. Fig. 69.

Draw Df to the other focus, and DE perpendicular to Aa; take L a point in the axis ſo that AL$=$FD, and conſequently L$a$$=Df$; then CL is evidently half the ſum of AL and aL, or of FD and fD, and CE half the ſum of FE and fE, and becauſe

$$Df - DF : Ff :: fE + FE : Df + DF \text{ (Trig.)}$$

by taking the halves of the terms of the proportion,

$$CA : CF :: CE : CL.$$
$$\text{But } CA : CF :: CG : CA \text{ (def. 17.)}$$
$$\text{therefore, } CG : CA :: CE : CL,$$
$$\text{hence (19. 5. E.) } EG : AL :: CG : CA :: CA : CF,$$
$$\text{that is, } DK : DF :: CA : CF.$$

Cor. 1. If the tangent GMN be drawn through M, the extremity of the ordinate paſſing through the focus, and ED be produced to meet GM in N, EN ſhall be equal to DF. For draw MO perpendicular to the directrix, then, becauſe M and D are points in the hyperbola, and from ſimilar triangles,

$$FM : FD :: MO : DK :: GF : GE :: MF : EN,$$

therefore FD$=$EN.

Cor. 2. If AI and $a\,i$ be drawn perpendicular to the tranſverſe axis at its extremities, meeting the tangent GM in I and i, then AI$=$AF and $ai$$=$$a$F.

Prop. XXIX.

If through P and Q the vertices of two ſemi-diameters of an hyperbola there be drawn ſtraight lines PD, QE parallel to one of the aſymptotes CN, meeting the other aſymptote in D and E, the hyperbolic ſector PCQ is equal to the hyperbolic trapezium PDEQ. Fig. 70.

Let CQ meet PD in G. The triangles CDP, CEQ are equal (1 cor. 14.) therefore, taking the triangle CDG from both, the triangle CGP is equal to the quadrilateral DEQG; to theſe add the figure

PGQ, and the hyperbolic ſector PCQ is equal to the hyperbolic trapezium PDEQ.

Prop. XXX.

Fig. 71. If from the centre of an hyperbola the ſegments CD, CE, CH be taken in continued proportion, in one of the aſymptotes, and the ſtraight lines DP, EQ, HR be drawn parallel to the other aſymptote, meeting the hyperbola in P, Q, R, the hyperbolic areas PDEQ, QEHR are equal.

Through Q draw a tangent to the curve, meeting the aſymptotes in K and L: join PR meeting the aſymptotes in M and N; draw the ſemi-diameters CP, CQ, CR, let CQ meet PR in G.

Becauſe QE is parallel to CM, and KQ is equal to QL (2 cor. 13.) CE is equal to EL; and becauſe MC, PD, RH, are parallel, and MP is equal to RN (1 cor. 13.) CD is equal to HN. Now, by hypotheſis,

$$\begin{aligned} CD : CE &:: CE : CH, \\ \text{therefore } NH : LE &:: CE : CH; \\ \text{but } CE : CH &:: HR : EQ \ (2\text{cor.}14.) \\ \text{therefore } NH : LE &:: HR : EQ, \\ \text{and by alternation } NH : HR &:: LE : EQ. \end{aligned}$$

Now the angles at H and E are equal, therefore the triangles NHR, LEQ are equiangular, and NR is parallel to LQ; conſequently RP is an ordinate to the diameter CQ (8.) and is biſected by it at G; and as CQ biſects all lines which are parallel to KL, and are terminated by the hyperbola, it will biſect the area PQR. Let the equal areas PQG, RQG be taken from the equal triangles PCG, RCG, and there will remain the hyperbolic ſectors PCQ, RCQ equal to each other. Therefore (29.) the areas DPQE, EQRH are alſo equal.

Cor. Hence if CD, CE, CH, &c. any number of ſegments of the aſymptote be taken in continued proportion, the areas DPQE, DPQRH, &c. reckoned from the firſt line DP, will be in arithmetical progreſſion.

Prop. XXXI. Problem.

Fig. 72. 73. Two ſtraight lines A *a*, B *b*, which biſect each other at right angles in C, being given by poſition, to deſcribe an hyperbola, of which A *a* ſhall be the tranſverſe and B *b* the conjugate axis.

First Method. By a Mechanical Deſcription.

Fig. 72. Join AB, and in A *a*, produced, take CF, C *f* each equal to AB; the points F, *f* will be the foci of the hyperbola.

Let one end of a ſtring be faſtened at F, and the other to G the extremity of a ruler *f* DG, and let the difference between the length of the ruler and the ſtring be equal to A *a*. Let the other end of the ruler be fixed to the point *f*, and let the ruler be made to revolve about *f* as a centre in the plane in which the axes are ſituated, while the ſtring is ſtretched by means of a pin D, ſo that the part of it between G and D is applied cloſe to the edge of the ruler; the point of the pin will by its motion trace a curve line DAD upon the plane which is one of the hyperbolas required.

If the ruler be now made to revolve about the other focus F, while the end of the ſtring is faſtened to *f*, the oppoſite hyperbola will be deſcribed by the moving point D; for in either caſe G *f*—(GD+DF), that is, D *f*—DF is by hypotheſis equal to A *a* the tranſverſe axis.

Second Method. By finding any number of points in the Curve.

Find F, either of the foci as before, draw HAK, *h a k* perpendicular to the tranſverſe axis at its extremities, and AH and AK on each ſide of the vertex equal to AF, alſo *a h* and *a k* each equal to *a* F; join H *h* and K *k*; take E any point in A *a*, and through E draw NE *n* parallel to HK, meeting H *h* and K *k* in N and *n*. On F as a centre, with a radius equal to EN or E *n*, let a circle be deſcribed meeting N *n* in D and *d*, theſe will be two points in the hyperbola; and in the ſame way may any number of points in the hyperbola, or oppoſite hyperbolas, be found. The reaſon of this conſtruction is obvious from cor. 1. and 2. to Prop. 28. Fig. 73.

Prop. XXXII. Problem.

Plate CLXII.

An hyperbola being given by poſition, to find its axes.

Fig. 74. Let HA *h* be the given hyperbola. Draw two parallel ſtraight lines H *h*, K *k* terminating in either of the oppoſite hyperbolas, and biſect them at L and M; join LM, and produce it to meet the hyperbola in P; then LP will be a tranſverſe diameter (4 cor. 8.) Let *p* be the point in which it meets the oppoſite hyperbola, biſect P *p* in C, the point C is the centre (2.) Take D any point in the hyperbola, and on C as a centre with the diſtance CD deſcribe a circle; if this circle lie wholly without the oppoſite hyperbolas, then CD muſt be half the tranſverſe axis (20.), but if not, let the circle meet the hyperbola again in *d*, join D *d*, and biſect it in E, join CE, meeting the oppoſite hyperbolas in A and *a*, then A *a* will be the tranſverſe axis (5 cor. 8.) for it is perpendicular to D *d* (3. 3. E.) which is an ordinate to A *a*. The other axis will be found by drawing B *b* a ſtraight line through the centre perpendicular to A *a*, and taking CB ſo that CB^2 may be a fourth proportional to the rectangle $AE \cdot Ea$, and the ſquares of DE and CA, thus CB is half the conjugate axis (19.).

PART IV.

SECT. I.

OF THE CONE AND ITS SECTIONS.

Definitions.

Fig. 75. I. If through the point V, without the plane of the circle ADB, a ſtraight line AVE be drawn, and produced indefinitely both ways, and if the point V remain fixed while the ſtraight line AVE is moved round the whole circumference of the circle, two ſuperficies will be generated by its motion, each of which is called a *Conical Superficies*, and theſe mentioned together are called *Oppoſite Conical Superficies*.

II. The ſolid contained by the conical ſuperficies, and the circle ADB is called a *Cone*.

III. The fixed point V is called the *Vertex of the cone*.

IV. The circle ADB is called the *Baſe of the cone*.

V. Any ſtraight line drawn from the vertex to the circumference of the baſe is called a *Side of the cone*.

VI. A ſtraight line VC drawn through the vertex of the cone, and the centre of the baſe, is called the *Axis of the cone*.

VII. If the axis of the cone be perpendicular to the baſe it is called a *Right cone*.

VIII. If the axis of the cone be not perpendicular to the baſe, it is called a *Scalene cone*.

Prop. I.

If a cone be cut by a plane paſſing through the vertex, the ſection will be a triangle.

Fig. 75. Let ADBV be a cone of which VC is the axis; let AD be the common ſection of the baſe of the cone and the cutting plane; join VA, VD. When the generating line comes to the points A and D, it is evident that it will coincide with the ſtraight lines VA, VD, they are therefore in the ſurface of the cone, and they are in the plane which paſſes through the points V, A, D, therefore the triangle VAD is the common ſection of the cone and the plane which paſſes through its vertex.

Prop. II.

If a cone be cut by a plane parallel to its baſe, the ſection will be a circle, the centre of which is in the axis.

Fig. 75. Let EFG be the ſection made by a plane parallel to the baſe of the cone, and VAB, VCD two ſections of the cone made by any two planes paſſing through the axis VC; let EG, HF be the common ſections of the plane EFG, and the triangles VAB, VCD. Becauſe the planes EFG, ADB are parallel, HE, HF will be parallel to CA, CD, and

$$AC : EH :: (VC : VH ::)\ CD : HF,$$

but $AC=CD$, therefore $EH=HF$. For the ſame reaſon $GH=HF$, therefore EFG is a circle of which H is the centre and EG the diameter.

Prop. III.

Fig. 76. If a ſcalene cone ADBV be cut through the axis by a plane perpendicular to the baſe, making the triangle VAB, and from any point H, in the ſtraight line AV, a ſtraight line HK be drawn in the plane of the triangle VAB, ſo that the angle VHK may be equal to the angle VBA, and the cone be cut by another plane paſſing through HK perpendicular to the plane of the triangle ABC, the common ſection HFKM of this plane and the cone will be a circle.

Take any point L in the ſtraight line HK, and through L draw EG parallel to AB, and let EFGM be a ſection parallel to the baſe, paſſing through EG; then the two planes HFKM, EFGM being perpendicular to the plane VAB, their common ſection FLM is perpendicular to ELG, and ſince EFGM is a circle (by laſt prop) and EG its diameter, the ſquare of FL is equal to the rectangle contained by EL and LG (35. 3. E.); but ſince the angle VHK is equal to VBA, or VGE, the angles EHK, EGK are equal, therefore the points E, H, G, K, are in the circumference of a circle (21. 3. E.), and $HL \cdot LK = EL \cdot LG$ (35. 3. E.) $= FL^2$, therefore the ſection HFKM is a circle of which HLK is a diameter (35. 3. E.).

This ſection is called a *Subcontrary Section*.

Prop. IV.

If a cone be cut by a plane which does not paſs through the vertex, and which is neither parallel to the baſe, nor to the plane of a ſubcontrary ſection, the common ſection of the plane and the ſurface of the cone will be an ellipſe, a parabola, or an hyperbola, according as the plane paſſing through the vertex parallel to the cutting plane falls without the cone, touches it, or falls within it.

Fig. 77, 78, 79. Let ADBV be any cone, and let ONP be the common ſection of a plane paſſing through its vertex and the plane of the baſe, which will fall without the baſe, will touch it, or will fall within it.

Let FKM be a ſection of the cone parallel to VPO; through C the centre of the baſe draw CN perpendicular to OP, meeting the circumference of the baſe in A and B; let a plane paſs through V, A and B, meeting the plane OVP in the line NV, the ſurface of the cone in VA, VB, and the plane of the ſection FKM in LK; then, becauſe the planes OVP, MKF are parallel, KL will be parallel to VN, and will meet VB one ſide of the cone in K; it will meet VA the

the other ſide in H, fig. 77. within the cone; it will be parallel to VA in fig. 78. and it will meet VA, produced beyond the vertex, in H, fig. 79.

Let EFGM be a ſection of the cone parallel to the baſe, meeting the plane VAB in EG, and the plane FKM in FM, and let L be the interſection of EG and FM, then EG will be parallel to BN, and FM will be parallel to PO, and therefore will make the ſame angle with LK wherever the lines FM, LK cut each other, and ſince BN is perpendicular to PO, EG is perpendicular to FM. Now the ſection EFGM is a circle of which EG is the diameter (2.); therefore FM is biſected at L, and $FL^2 = EL \cdot LG$.

Fig. 77. CASE I. Let the line PNO be without the baſe of the cone. Through K and H draw KR and HQ parallel to AB. The triangles KLG, KHQ are ſimilar, as alſo HLE, HKR; therefore

$$KL : LG :: KH : HQ,$$
$$\text{and } HL : LE :: KH : KR;$$
$$\text{therefore } KL\cdot HL : LG\cdot LE \text{ or } LF^2 :: KH^2 : HQ\cdot KR.$$

Now the ratio of KH^2 to $HQ\cdot KR$ is the ſame wherever the ſections HFKM, EFGM interſect each other, therefore $KL\cdot HL$ has a conſtant ratio to LF^2, conſequently (1 cor. 11. Part II.) the ſection HFKM is an ellipſe, of which HK is a diameter and MF an ordinate.

Fig. 78. CASE II. Next, ſuppoſe the line ONP to touch the circumference of the baſe in A. Let DIS be the common ſection of the baſe and the plane FKM, the line DIS is evidently parallel to FLM and perpendicular to AB, therefore $DI^2 = AI \cdot IB$,

$$\text{hence } DI^2 : FL^2 :: AI \cdot IB : EL \cdot LG.$$

But ſince EG is parallel to AB, and IK parallel to AV, AI is equal to EL, and

$$IB : LG :: KI : KL;$$
$$\text{therefore } DI^2 : FL^2 :: KI : KL.$$

Hence it appears (cor. 9. Part I.), that the ſection DFKMS is a parabola, of which KLI is a diameter and DIS, FLM ordinates to that diameter.

Fig. 79. CASE III. Laſtly, Let the line PNO fall within the baſe; draw VT through the vertex parallel to EG. The triangles HVT, HEL are ſimilar, as alſo the triangles KVT, KGL, therefore

$$HT : TV :: HL : LE,$$
$$\text{and } KT : TV :: KL : LG,$$
$$\text{therefore } HT\cdot KT : TV^2 :: HL\cdot LK : LE\cdot LG \text{ or } LF^2.$$

Hence it appears, that $HL\cdot LK$ has to LF^2 a conſtant ratio, therefore the ſection DFKMS is an hyperbola, of which KH is a tranſverſe diameter, and FM an ordinate to that diameter (2 cor. 19. Part III.).

SCHOLIUM.

From the four preceding propoſitions it appears, that the only lines which can be formed by the common ſection of a plane and the ſurface of a cone, are theſe five. I. A ſtraight line, or rather two ſtraight lines interſecting each other in the vertex of the cone, and forming with the ſtraight line which joins the points in which they meet the baſe a triangle. II. A circle. III. An ellipſe. IV. A parabola. V. An hyperbola. The two firſt of theſe, however, viz. the triangle and circle, may be referred to the hyperbola and the ellipſe, for if the axes of an hyperbola be ſuppoſed to retain a conſtant ratio to each other, and, at the ſame time to diminiſh continually, till at laſt the vertices coincide; the oppoſite hyperbolas will evidently become two ſtraight lines interſecting each other in a point; and a circle may be conſidered as an ellipſe, whoſe axes are equal, or whoſe foci coincide with the centre; ſo that the only three ſections which require to be ſeparately conſidered, are the *ellipſe*, the *parabola*, and the *hyperbola*.

SECT. II.

OF THE CURVATURE OF THE CONIC SECTIONS.

DEFINITIONS.

I. A circle is ſaid to *touch* a conic ſection in any point, when the circle and conic ſection have a common tangent in that point.

II. If a circle touch a conic ſection in any point, ſo that no other circle touching it in the ſame point can paſs between it and the conic ſection on either ſide of the point of contact, it is ſaid to have the *ſame curvature* with the conic ſection in the point of contact, and it is called the CIRCLE OF CURVATURE.

LEMMA.

Fig. 80. Let PL be any chord in a circle, PX a tangent at one of its extremities, and LK a diameter paſſing through the other extremity: draw any chord Gg parallel to the tangent PX, meeting PL in E, and from its extremities draw GH, gh perpendicular to the diameter, meeting PL in N and n; the ſquare of GE is equal to the rectangle contained by PE and LN, and the ſquare of gE is equal to the rectangle contained by PE and Ln.

FROM G and g draw the ſtraight lines GP, gP, GL, gL, and let LM a perpendicular to the diameter, and therefore a tangent to the circle at L, meet the tangent PX in M. The triangle NGE is evidently ſimilar to the triangle LMP, and $LM = MP$, therefore $NG = GE$; hence the angles GNL, GEP are equal. Now the angle PGE is equal to the alternate angle GPX, that is, to the angle GLN in the alternate ſegment of the circle (32. 3. E.), therefore the triangles PGE, GLN are ſimilar, and

$$PE : EG :: GN \text{ or } EG : NL,$$
$$\text{therefore } GE^2 = PE \cdot NL.$$

In the ſame way it may be demonſtrated that $ng = gE$, and that the triangles PgE, gLn are ſimilar, and therefore that

$$PE : Eg :: gn \text{ or } Eg : nL,$$
$$\text{and hence } gE^2 = PE \cdot nL.$$

PROP. I.

If a circle be deſcribed touching a conic ſection, and cutting off from the diameter that paſſes

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through the point of contact a ſegment greater than the parameter of that diameter, a part of the circumference on each ſide of the point of contact will be wholly without the conic ſection; but if it cuts off from the diameter a ſegment leſs than the parameter, a part of the circumference on each ſide of the point of contact will be wholly within the conic ſection.

Fig. 81, 82, 83, 84. LET Pp be the diameter of a conic ſection; let a circle GPg touch the ſection in P the vertex of the diameter, and cut off from it a ſegment PL, which is either greater or leſs than the parameter of the diameter; in the former caſe a part GPg of the circumference of the circle on each ſide of P the point of contact will be wholly without the conic ſection, as in fig. 81. and fig. 82. and in the latter a part GPg of the circumference on each ſide of P will be wholly within the ſection, as in fig. 83. and fig. 84.

Through L draw LK a diameter of the circle; let DEd an ordinate to the diameter of the ſection meet the circle in G and g, ſo that the points G, P, g may be on the ſame ſide of LK the diameter of the circle, and draw GH, gh, PO perpendicular to LK, the two former lines meeting LP in N and n. From L towards P place LR in the diameter equal to its parameter; then in the former caſe the point R will fall between L and P, as in fig. 81. and 82.; and in the latter it will fall in LP produced, as in fig. 82. and 83.

CASE I. Firſt, let the ſection be a parabola (fig. 81. 83.)

Then DE^2, alſo $dE^2 = PE \cdot RL$ (Cor. prop. 9. of Part I.)

$$\left.\begin{array}{r} \text{Now } GE^2 = PE \cdot LN \\ \text{and } gE^2 = PE \cdot Ln \end{array}\right\} \text{(Lemma).}$$

$$\begin{array}{r} \text{Therefore } DE^2 : GE^2 :: LR : LN, \\ \text{and } dE^2 : gE^2 :: LR : Ln. \end{array}$$

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Now if the ordinate Dd be ſuppoſed to approach to the tangent at the vertex, the points G, g will approach to P, the lines GH, gh to the line PO, and the points N, n to the vertex P, where they will at laſt coincide; hence it is evident, that the ordinate DEd may be at ſuch a diſtance from the tangent that the points N, n, and the vertex P, may be all on the ſame ſide of the point R; in this poſition of the ordinate if the ſegment cut off by the circle be greater than the parameter, as in fig. 81. then LR will be leſs than either LN, or Ln, and therefore DE^2 leſs than GE^2, alſo dE^2 leſs than gE^2, ſo that the points G, g are both without the parabola. If the ordinate be ſuppoſed to approach nearer to the tangent, as the points N, n will alſo approach nearer to P, the line LR will ſtill be leſs than either LN, or Ln, and therefore DE^2 leſs than GE^2, and dE^2 leſs than gE^2. Hence it follows, that every point in the arch GPg, which lies on each ſide of the point of contact is without the parabola.

If the ſegment cut off by the circle be leſs than the parameter (fig. 83.), and therefore LR greater than either LN or Ln, then, reaſoning as before, it will appear that DE^2 is greater than GE^2, and dE^2 greater than gE^2, ſo that the points G, g are within the parabola; and as the ſame will hold for every other poſition of the ordinate nearer to the tangent, the arch GPg which lies on each ſide of the point of contact is wholly within the parabola.

CASE II. Next, let the ſection be an ellipſe, or an hyperbola (fig. 82. 84.) (A). Take V a point in LR, ſo that

$$pP : pE :: LR : LV,$$

$$\text{and therefore } Pp : LR :: pE : LV :: pE \cdot EP : LV \cdot EP.$$

$$\text{But } Pp : LR :: pE \cdot EP : DE^2, \text{ or } dE^2 \text{ (13. Part II. and 21. Part III.),}$$

$$\text{therefore } DE^2, \text{ alſo } dE^2 = LV \cdot EP.$$

$$\left.\begin{array}{r} \text{Now } GE^2 = LN \cdot EP \\ \text{and } gE^2 = Ln \cdot EP, \end{array}\right\} \text{(Lemma.)}$$

$$\begin{array}{r} \text{therefore } DE^2 : GE^2 :: LV : LN, \\ \text{and } dE^2 : gE^2 :: LV : Ln. \end{array}$$

Now as Pp and RL are ſimilarly divided at E and V, if the point E approach to P, the point V will approach to R, and as E may come nearer to P than any aſſignable line, ſo V may come nearer to R than any aſſignable line; but as in the ſame circumſtances GH and gh approach to PO, and N and n approach to P, it is evident that the ordinate Dd may have ſuch a poſition that the points N, n, and the vertex P, may be all on the ſame ſide of V, and the ſame thing have place for every other poſition of the ordinate nearer to the tangent; therefore, in theſe circumſtances, when LP the ſegment cut off from the diameter is greater than LR the parameter (fig. 82.), LV will be leſs than either LN or Ln, and conſequently DE^2 leſs than GE^2, alſo dE^2 leſs than gE^2; thus the points G, g, as well as every other point in the arch GPg which lies on both ſides of the vertex, are without the ellipſe or hyperbola.

On the contrary, when LP is leſs than LR the parameter (fig. 84.), LV will be greater than either LN or Ln, and therefore DE^2 greater than GE^2, alſo dE^2 greater than gE^2; and therefore the points G, g, as well as every other point in the arch GPg, are within the ellipſe or hyperbola.

COR. 1. If a circle touch a conic ſection, and cut off from the diameter that paſſes through the point of contact a ſegment equal to its parameter, it will have the ſame curvature with the conic ſection in the point of

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(A) As the reaſoning applies alike to the ellipſe and hyperbola, to avoid a number of figures, thoſe for the hyperbola are omitted.

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of contact. For if a greater circle be deſcribed it will cut off from the diameter a ſegment greater than its parameter, therefore a part of its circumference on each ſide of the point of contact will be wholly without the conic ſection; and as it will alſo be without the former circle, it will not paſs between that circle and the conic ſection at the point of contact. If, on the other hand, a leſs circle be deſcribed, it will cut off from the diameter a ſegment leſs than its parameter, therefore a part of its circumference on each ſide of the point of contact will fall within the conic ſection; and as it will be within the former circle, it will not paſs between that circle and the conic ſection at the point of contact. Hence (Def. 2.), the circle which cuts off a ſegment equal to the parameter is the circle of curvature.

Cor. 2. Only one circle can have the ſame curvature with a conic ſection in a given point.

Prop. II.

Plate CLXIII.

The circle of curvature at the vertex of the axis of a parabola, or at the vertex of the tranſverſe axis of an ellipſe or hyperbola, falls wholly within the conic ſection; but the circle of curvature at the vertex of the conjugate axis of an ellipſe falls wholly without the conic ſection.

Fig. 85, 86, 87, 88.

Let Pp be the axis of a parabola (fig. 85.), and $PGLg$ the circle of curvature at its vertex, which therefore cuts off from the axis a ſegment PL equal to the parameter of the axis; becauſe the tangent at the vertex is common to the parabola and circle, the centre of the circle is in Pp. Let DEd an ordinate to the axis meet the circle in G and g; it may be ſhewn as in laſt propoſition that

$$DE^2 : GE^2 :: LP : LE.$$

But in every poſition of the ordinate LP is greater than LE, therefore DE^2 is always greater than GE^2, and dE^2 greater than gE^2; therefore the circle is wholly within the parabola. Next let Pp be the tranſverſe axis of an ellipſe or hyperbola (fig. 86, 87.), or the conjugate axis of an ellipſe (fig. 88.), and $PGLg$ the circle of curvature, then as in the parabola the centre of the circle will be in the axis. Draw Dd an ordinate to the axis meeting the circle in G, g; and take a point V in PL, ſo that

$$pP : pE :: LP : LV;$$

then it will appear as in laſt prop. that

$$DE^2 : GE^2 :: LV : LE.$$

Now, when Pp is the tranſverſe axis of an ellipſe, (fig. 86.) as Pp is greater than LP, and $Pp : PL :: PE : PV$, therefore PE is greater than PV, and hence LV is always greater than LE, therefore DE^2 is greater than GE^2, alſo dE^2 greater that gE^2, ſo that the circle falls wholly within the ellipſe.

Again, when Pp is the tranſverſe axis of an hyperbola (fig. 87.), as pE is greater than pP, therefore LV is greater than LP, and conſequently greater alſo than LE; hence DE^2 is greater than GE^2, and dE^2 is greater than gE^2, and the circle is wholly within the hyperbola.

Laſtly, When Pp is the conjugate axis of an ellipſe (fig. 88.) as Pp is leſs than LP, and $Pp : LP :: PE : PV$, therefore, PE is leſs than PV; hence LV is leſs than LE, and conſequently DE^2 is leſs than GE^2, alſo dE^2 leſs than gE^2, therefore the circle is wholly without the ellipſe.

Of the Curvature of the Conic Sections.

Prop. III.

Fig. 89, 90.

The circle of curvature at the vertex of any diameter of a conic ſection, which is not an axis, meets the conic ſection again in one point only; and between that point and the vertex of the diameter the circle falls wholly within the conic ſection on the one ſide, and wholly without it on the other.

Case I. Let the conic ſection be a parabola, of which Pp is a diameter (fig. 89.) and PLK the circle of curvature at the vertex, cutting off from the diameter a ſegment PL equal to its parameter. Draw LK a diameter of the circle, and draw PO perpendicular to LK, this line will neceſſarily meet the circle again, let it meet the circle in I; draw IS parallel to the tangent at P, meeting the chord PL in S; then, becauſe IP is perpendicular to LK,

$$IS^2 = PS \cdot PL \text{ (Lemma)};$$

hence (Cor. Prop. 9. Part I.) I is a point in the parabola.

Let DEd an ordinate to the diameter Pp meet the arch PLI anywhere in G; draw GH perpendicular to LK, meeting PL in N, then, becauſe LP is equal to the parameter, as in Prop. I. Caſe I.

$$DE^2 : GE^2 :: LP : LN :: LO : LH.$$

But wherever the point G be taken in the arch PLI, LO is greater than LH, therefore DE^2 is alſo greater than GE^2; thus the arch PGLI falls wholly within the parabola.

Let the ordinate DEd now meet the arch PKI anywhere, as at g, draw gh perpendicular to LK, meeting LP in n, then it will appear as before that

$$dE^2 : gE^2 :: LP : Ln :: LO : Lh;$$

but LO is leſs than Lh, and therefore dE^2 leſs than gE^2, thus the arch $PgKI$ falls wholly without the parabola.

Case II. Let the conic ſection be either an ellipſe or hyperbola (fig. 90.) of which Pp is a diameter, and PLK the circle of curvature at its vertex, cutting off PL equal to its parameter. Draw LK the diameter of the circle and LQ perpendicular to LK, and let pQ, a tangent to the conic ſection in p, meet LQ in Q. Join PQ, this line will neceſſarily meet the circle again; let it meet the circle in I; and draw IS. IT parallel to Qp, QL, meeting PL in S, T. Becauſe of the parallels,

$$pP : pS :: QP : QI :: LP : LT,$$
$$\text{hence } pP : LP :: pS : LT :: pS \cdot SP : LT \cdot SP;$$
$$\text{but } LT \cdot SP = IS^2 \text{ (Lemma)},$$
$$\text{therefore } pP : pS :: pS \cdot SP : SI^2;$$

hence I is a point in the ellipſe or hyperbola (13. Prop. Part II. and 21. Prop. Part III.).

Let DEd an ordinate to the diameter Pp meet the arch PLI anywhere in G, if the point L is between

P and p, or the arch PIL, if L is in Pp produced. Let Dd meet PI in Y, draw GH perpendicular to LK meeting PL in N, and PI in Z, and draw YV parallel to GN meeting LP in V. Becauſe EY, pQ are parallel, alſo VY, LQ,

$$Pp : pE :: (QP : QY ::)\ LP : LV;$$

now LP being the parameter, we have, as in Caſe II. Prop. I.

$$DE^2 : GE^2 :: LV : LN :: QY : QZ;$$

but wherever the point G be taken in the arch PGI, QY is greater than QZ, therefore alſo DE^2 is greater than GE^2; thus the arch PGI falls wholly within the conic ſection.

Let the ordinate DEd now meet the other arch PgI anywhere in g; draw gh perpendicular to LK meeting LP in n, and IP in z, then it will in like manner appear that

$$dE^2 : gE^2 :: LV : Ln :: QY : Qz;$$

and ſince in this caſe QY is leſs than Qz, therefore dE^2 is leſs than gE^2; hence the arch PgI is wholly without the conic ſection.

PROP. IV.

Fig. 91. The chord of the circle of curvature which is drawn from the point of contact through the focus of a parabola is equal to that which is cut off from the diameter; and half the radius of the circle is a third proportional to the perpendicular from the focus upon the tangent, and the diſtance of the point of contact from the focus.

LET PL be the chord cut off from the diameter, and PFH the chord paſſing through F the focus; draw PM the diameter of the circle, join HL, HM, and draw FK perpendicular to the tangent at P. Becauſe the lines PFH, PL make equal angles with the tangent at P (3. Part I.), the angles PHL, PLH are equal (32. 3. E). hence PH=PL. Secondly, the triangles FKP, PHM, being manifeſtly ſimilar,

$$FK : FP :: PH, \text{ or } 4PF : PM,$$

hence $FK : FP :: FP : \frac{1}{4}PM$, or $\frac{1}{2}$ the radius.

COR. 1. Hence the radius is equal to $\frac{2FP^2}{FK}$.

COR. 2. The radius is alſo equal to $\frac{2FK^3}{AF^2}$, where AF is the diſtance of the focus from the vertex of the parabola; for $FP=\frac{FK^2}{AF}$ (11. Part I.)

COR. 3. Hence alſo the radius is equal to $\frac{\frac{1}{2}L\cdot FP^3}{FK^3}$, where L denotes the parameter of the axis,

$$\text{for } \frac{2FP^2}{FK}=\frac{2AF\cdot FP^3}{AF\cdot FP\cdot FK}=\frac{\frac{1}{2}L\cdot FP^3}{FK^3}.$$

PROP. V.

Fig. 91. The radius of the circle of curvature at the vertex of any diameter of an ellipſe, or hyperbola, is a third proportional to the perpendicular drawn from the centre upon the tangent, and half the conjugate diameter; and the chord which is drawn from the point of contact through the focus is a third proportional to the tranſverſe axis, and conjugate diameter.

LET PL be the chord cut off from the diameter, and PFH the chord paſſing through F the focus; draw PM the diameter of the circle, and from the centre O draw OR perpendicular to PL, which will biſect PL in R; join HM, and draw the conjugate diameter QCq meeting PH in N and PM in S, then PS is equal to the perpendicular from the centre C upon the tangent. The triangles PSC, PRO are ſimilar, therefore,

$$PS : PC :: PR : PO,$$

$$\text{but } PC : CQ :: CQ : PR \text{ (Def. of param.)}$$

$$\text{therefore } PS : CQ :: CQ : PO.$$

Secondly, the triangles PSN, PHM are ſimilar,

$$\text{therefore } PN : PS :: PM : PH;$$

$$\text{but } PS : CQ :: (CQ : PO ::)\ Qq : PM,$$

$$\text{therefore } PN : CQ :: Qq : PH,$$

or, ſince PN=AC (18. Part II. and 25. Part III.),

$$Aa : Qq :: Qq : PH.$$

COR. 1. Hence the radius of curvature is equal to $\frac{CQ^2}{PS}$, and the chord paſſing through the focus is equal to $\frac{2CQ^2}{AC}$.

COR. 2. The radius of curvature is alſo equal to $\frac{CQ^3}{AC\cdot BC}$, for $PS=\frac{AC\cdot BC}{CQ}$ (14. Part II. and 23. Part III.).

COR. 3. Draw FK from the focus perpendicular to the tangent, and let L denote the parameter of the tranſverſe axis; the radius of curvature is alſo equal to $\frac{\frac{1}{2}L\times FP^3}{FK^3}$. For the triangles PFK, NPS are manifeſtly ſimilar, therefore

$$FK : FP :: PS : PN, \text{ or } AC :: BC : CQ;$$

$$\text{hence } CQ=\frac{FP}{FK}\times BC,$$

$$\text{and } \frac{CQ^3}{AC\cdot BC}=\frac{FP^3}{FK^3}\times\frac{BC^2}{AC}=\frac{FP^3}{FK^3}\times\frac{1}{2}L.$$

This expreſſion for the radius of curvature is the ſame for all the three conic ſections.

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CONIC SECTIONS.

Plate CLVI.

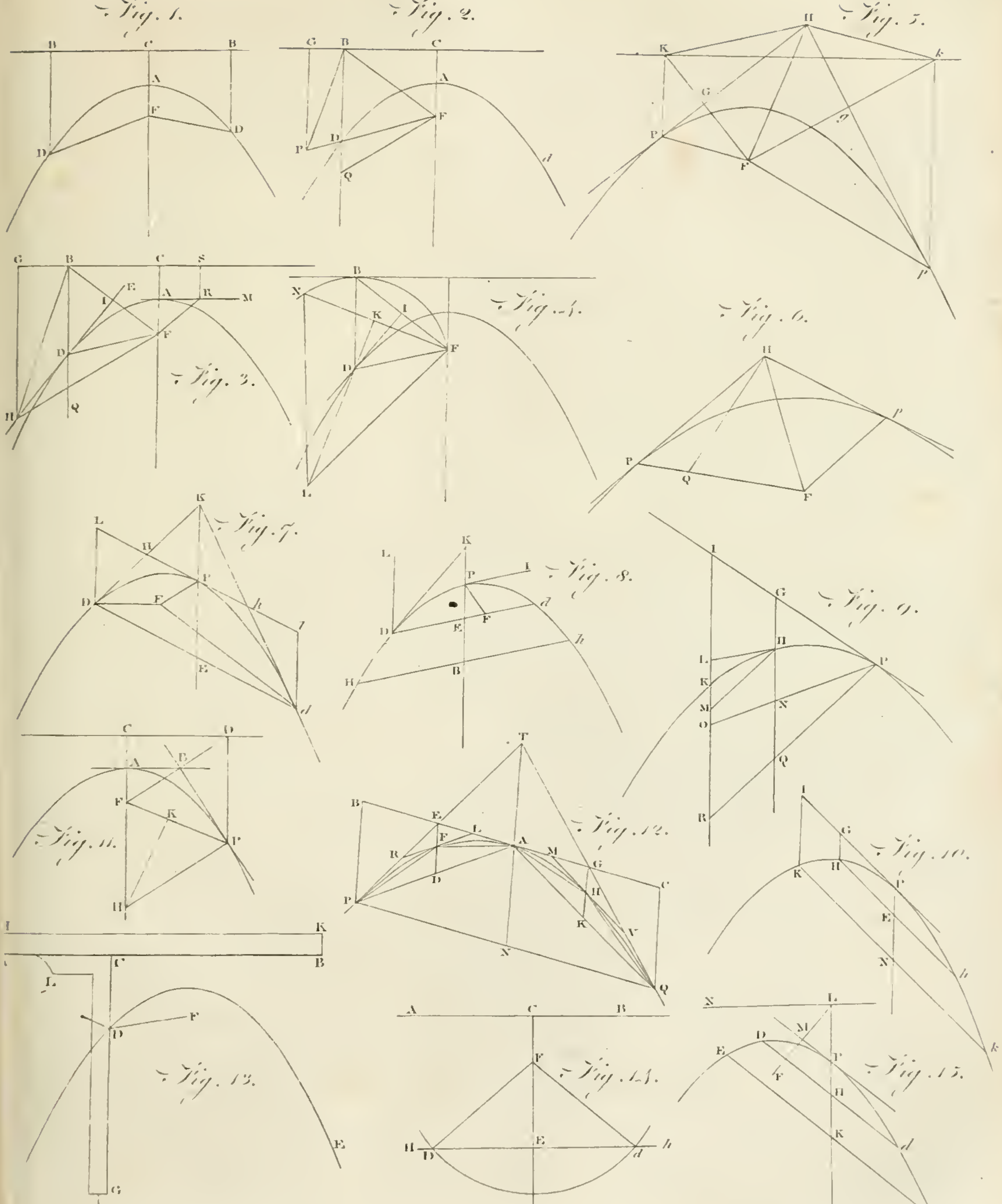

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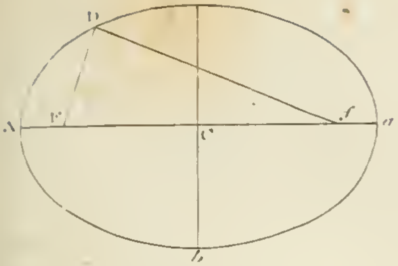
Fig. 16.



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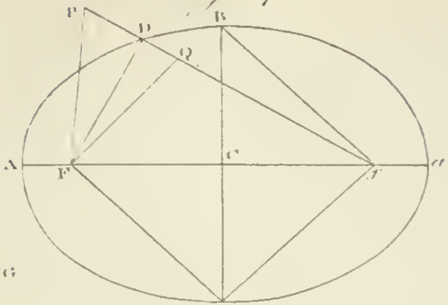

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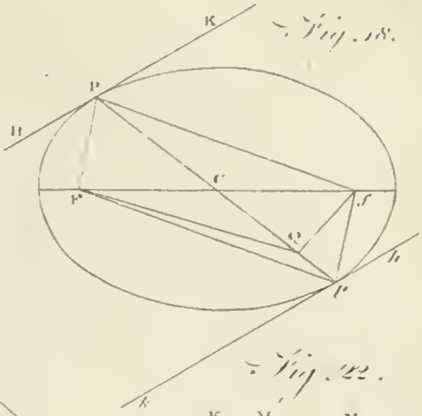

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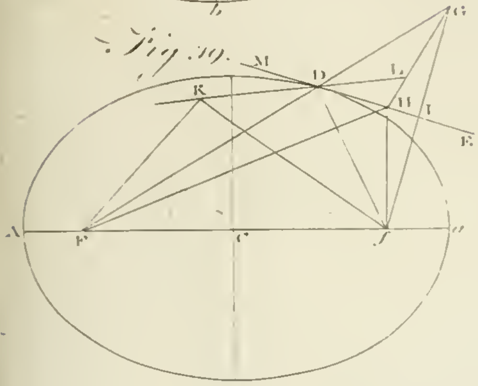

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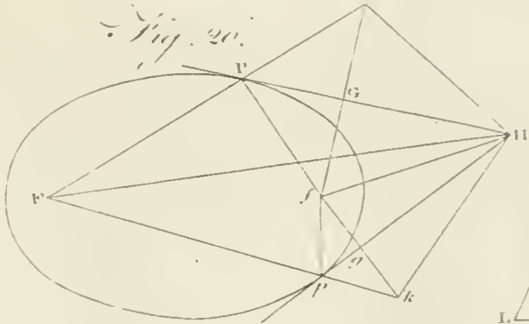

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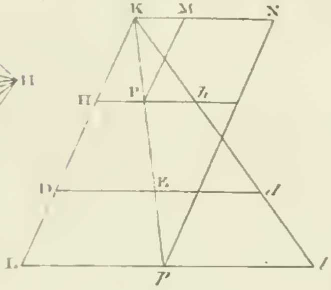

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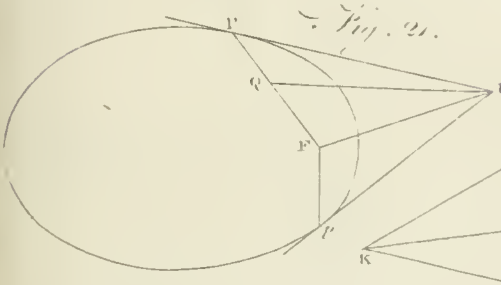

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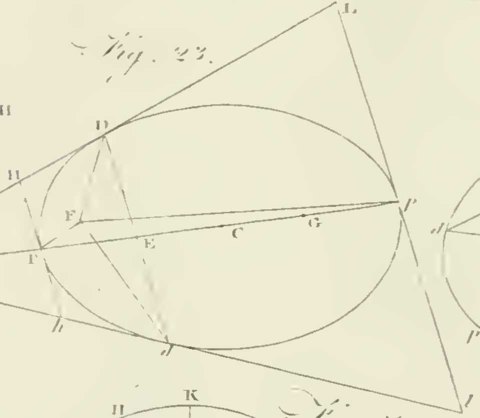

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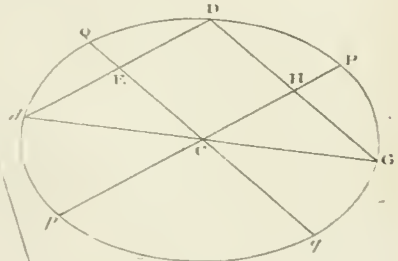

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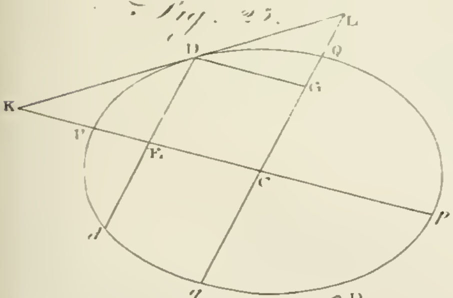

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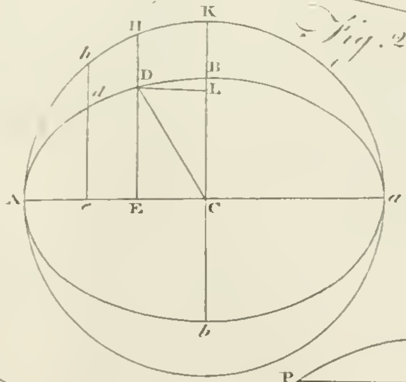

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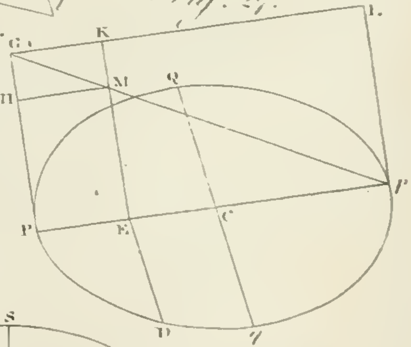

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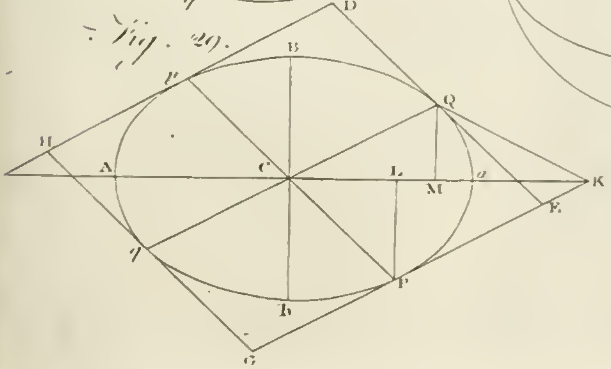

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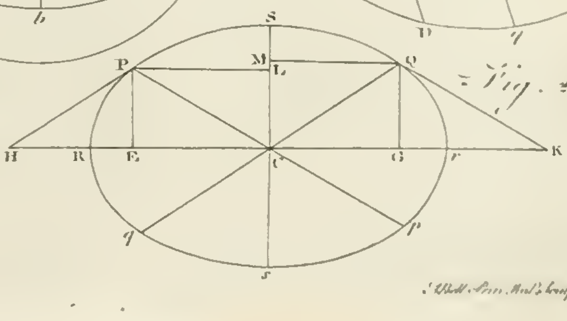

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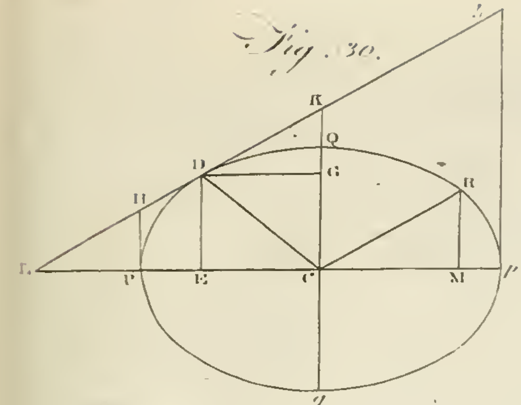
CONIC SECTIONS.

Plate CLVIII.

Fig. 30.



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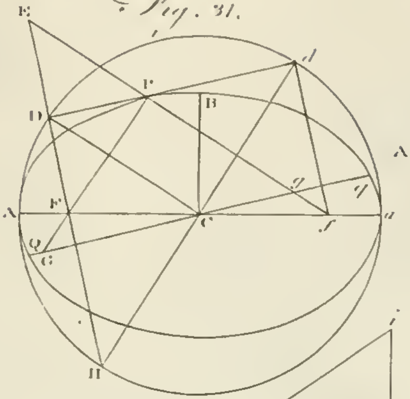

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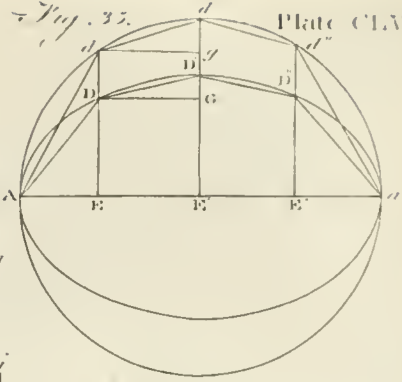

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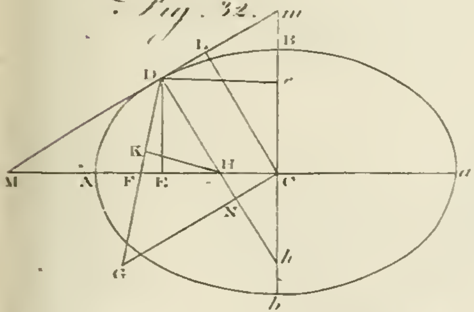

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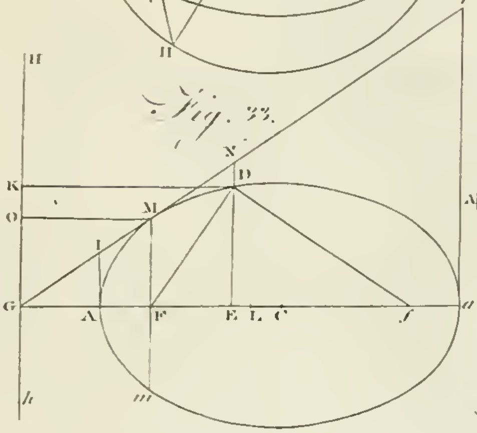

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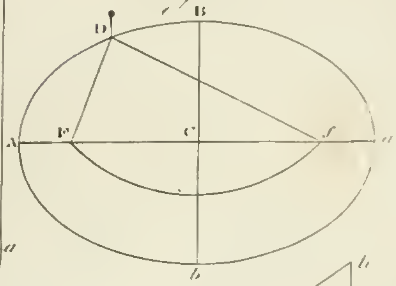

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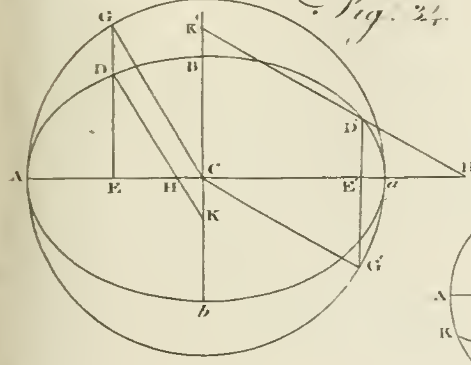

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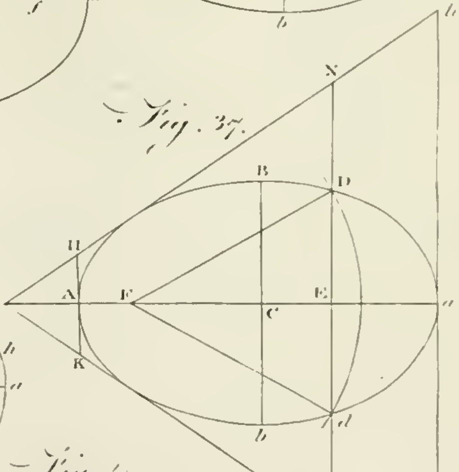

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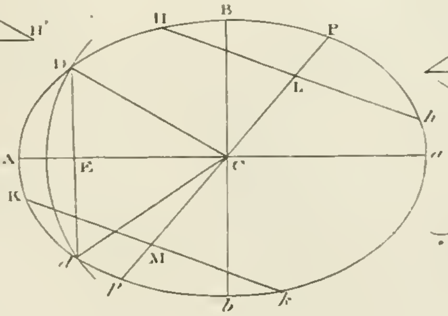

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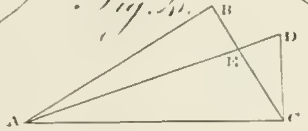

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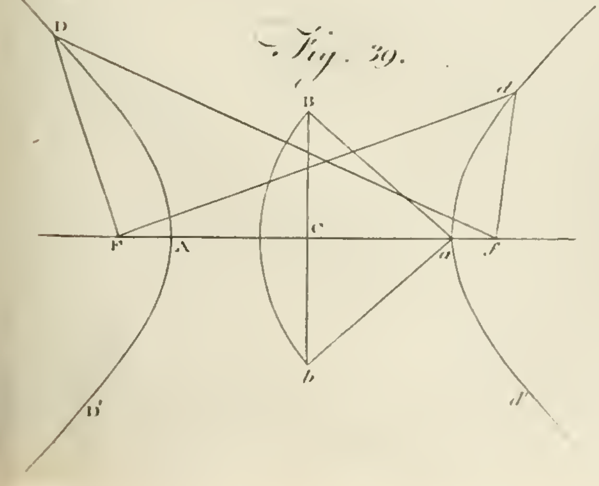

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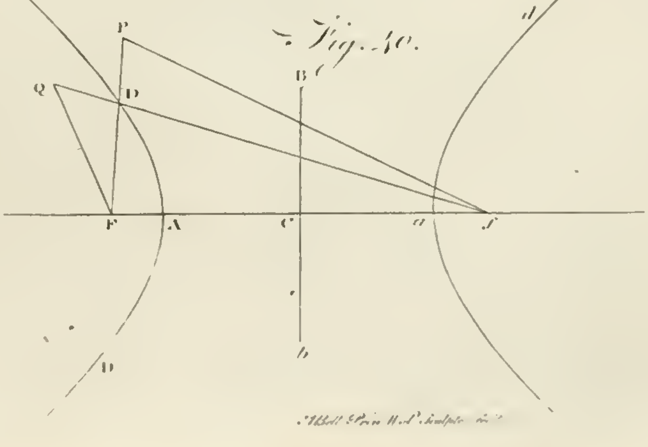
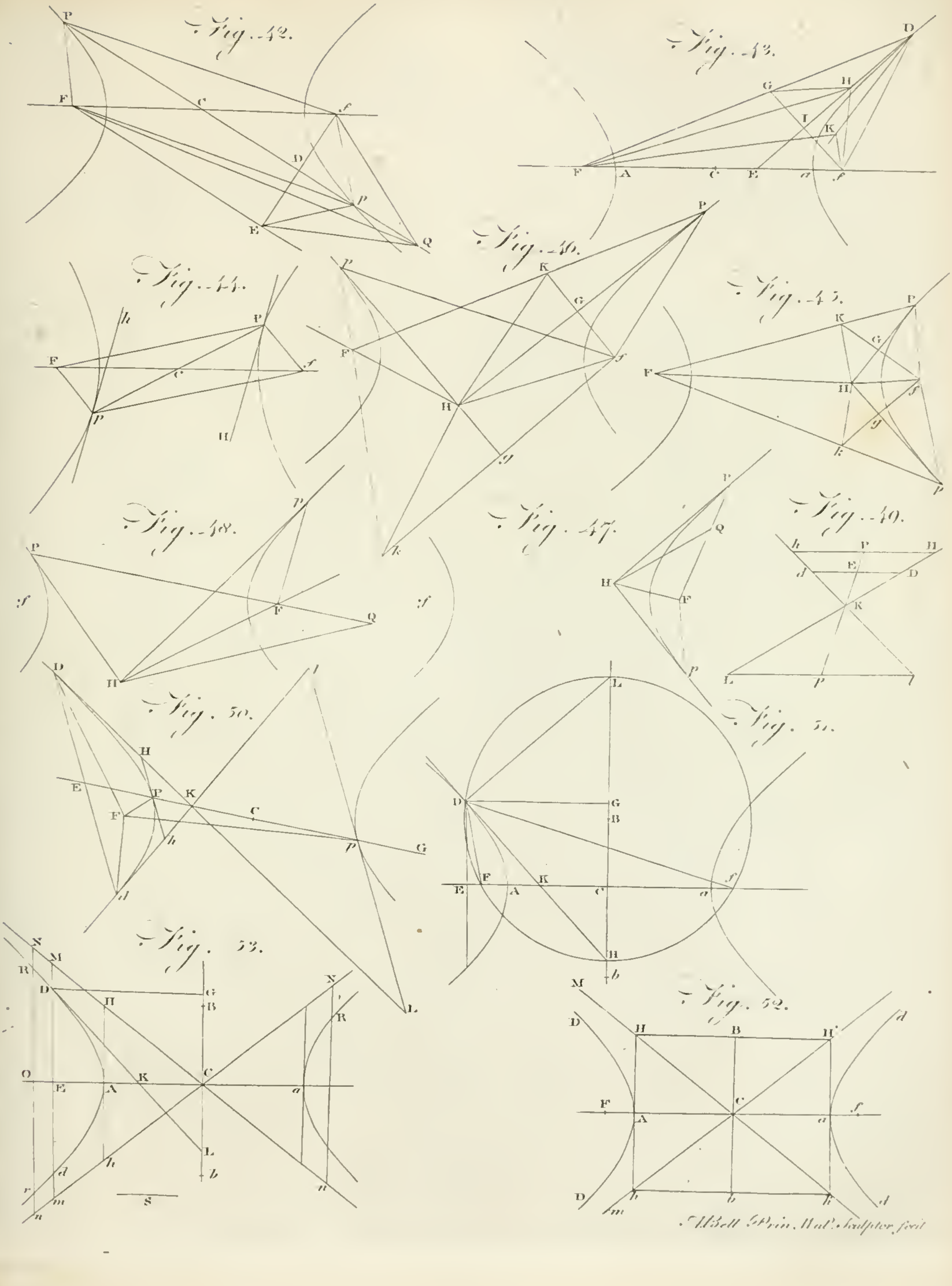


Abell & Prior Wal. sculpts [illegible]



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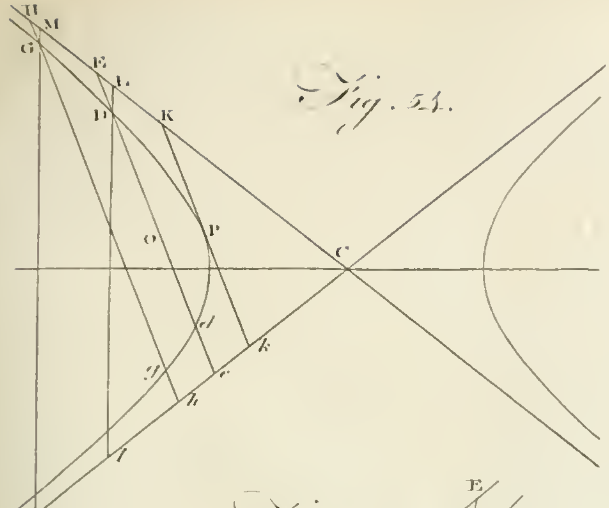
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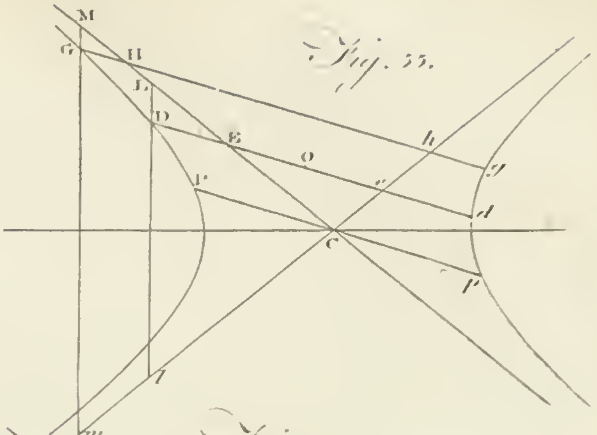
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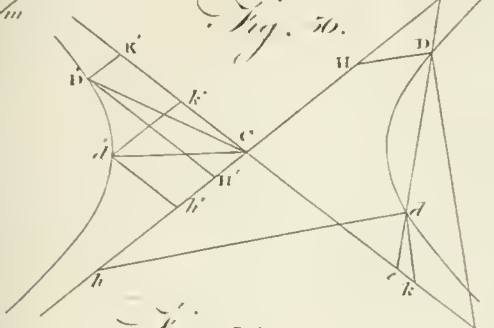
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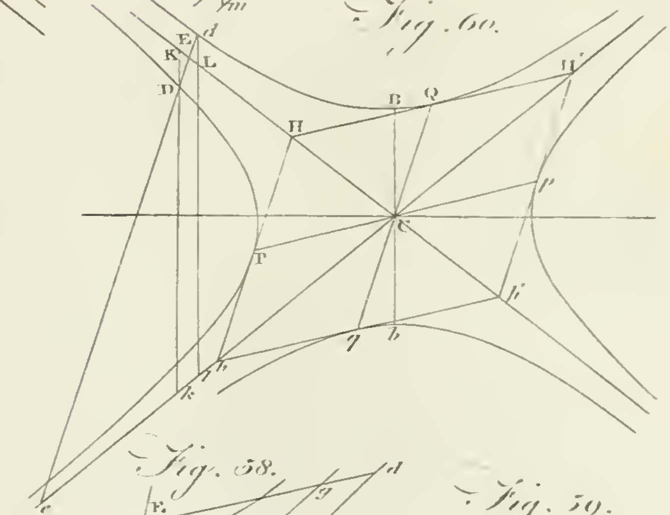
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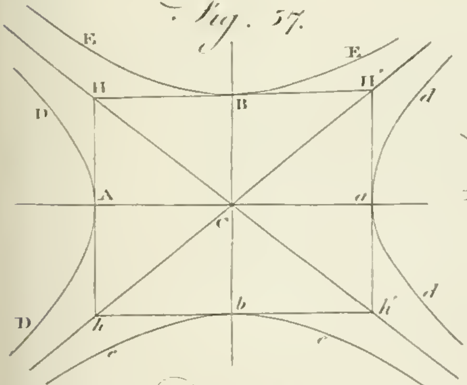
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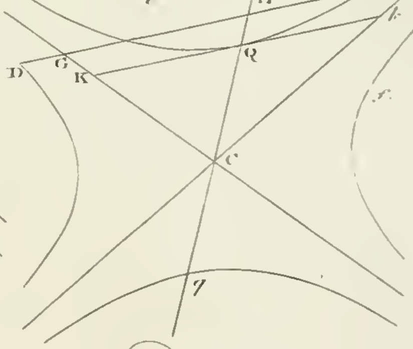
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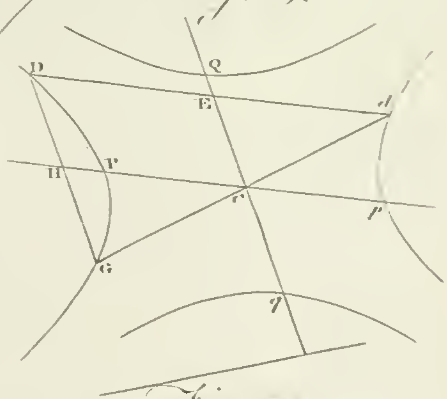
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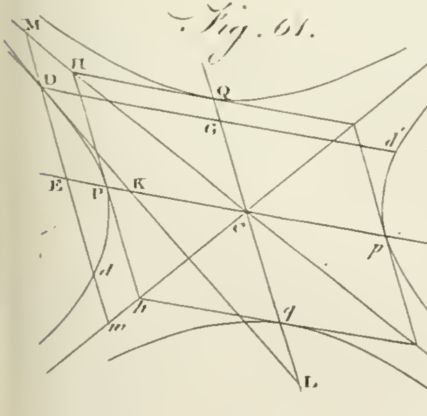
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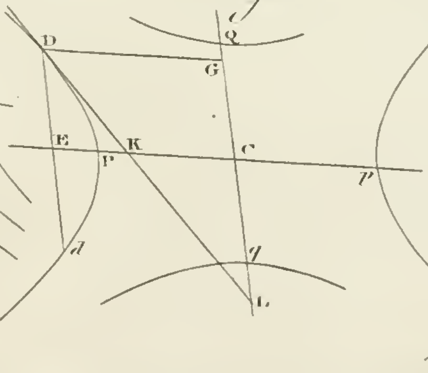
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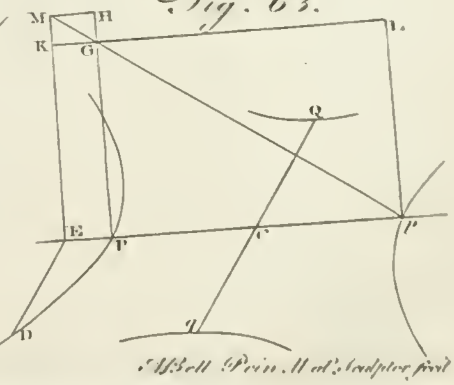
Fig. 63.

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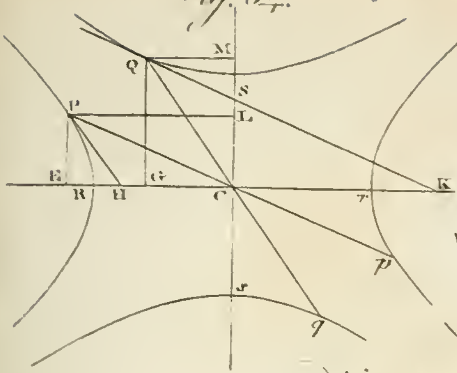
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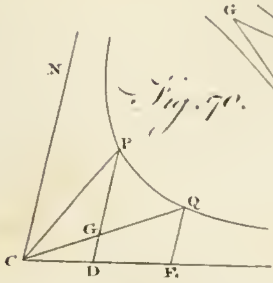
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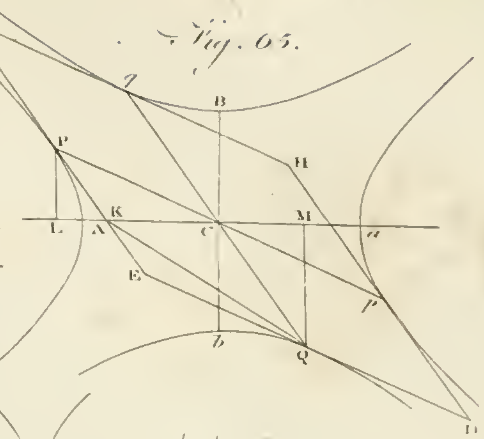
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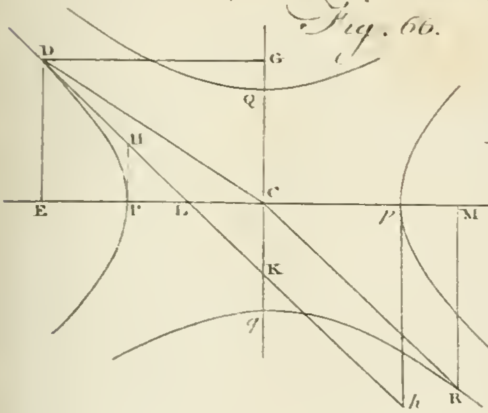
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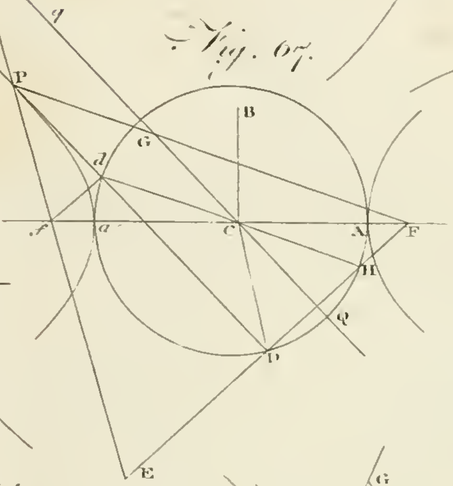
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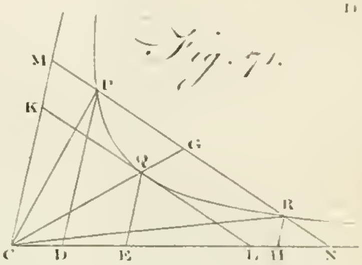
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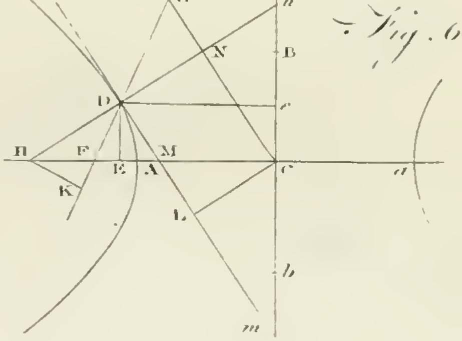
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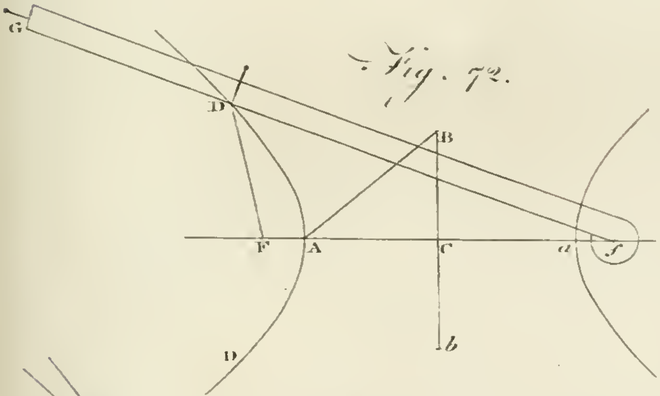
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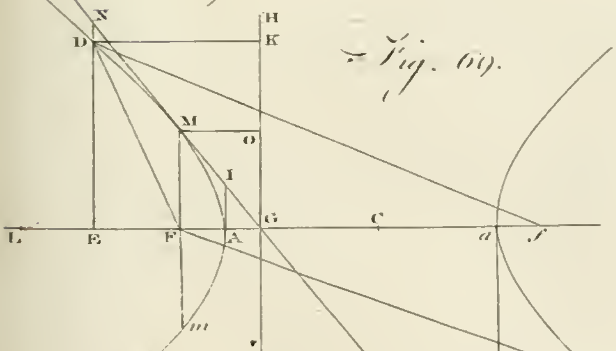
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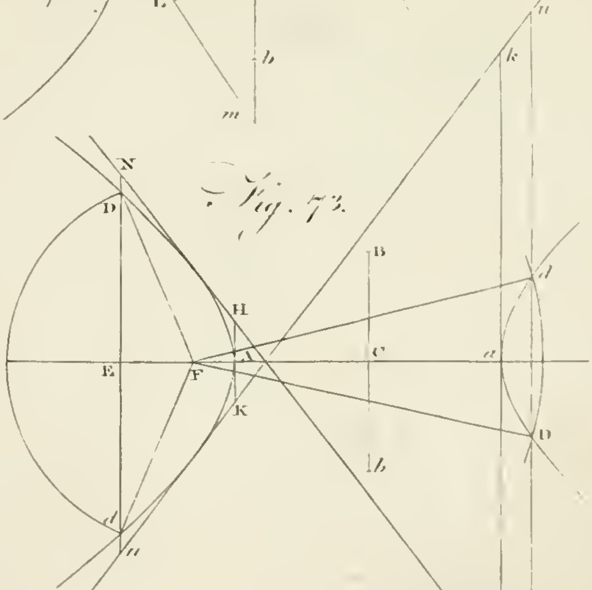
Fig. 73.

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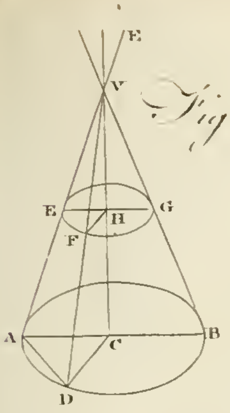
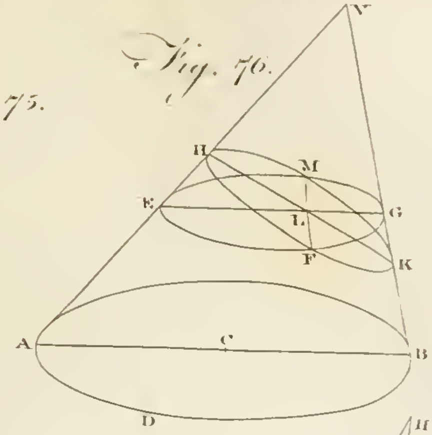


Fig. 75.



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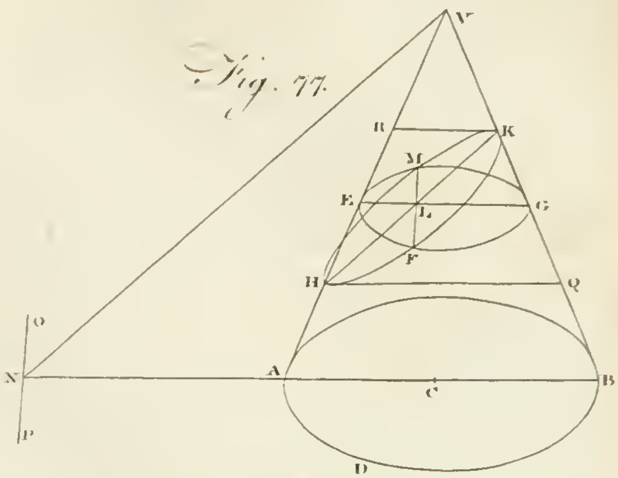

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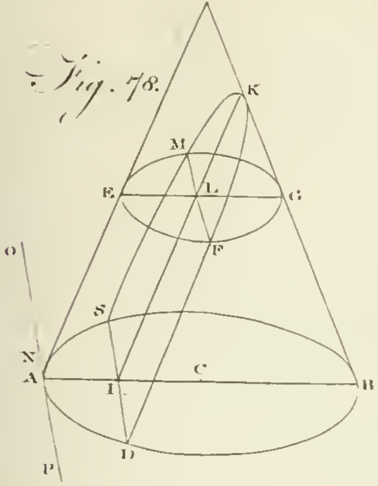

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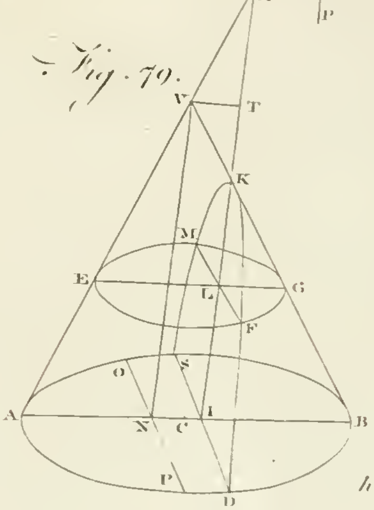

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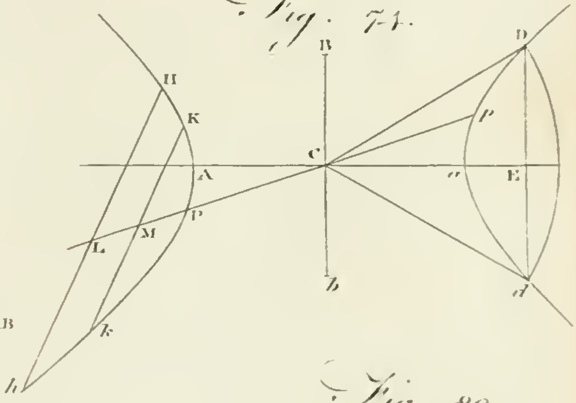

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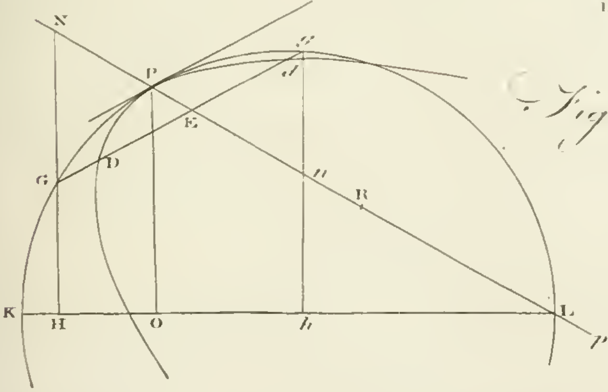

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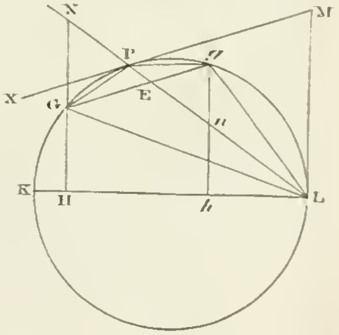

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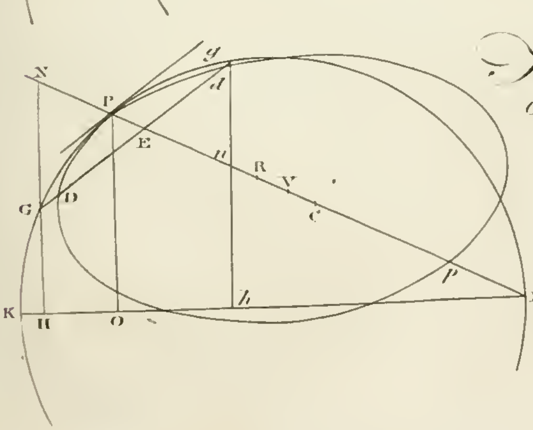

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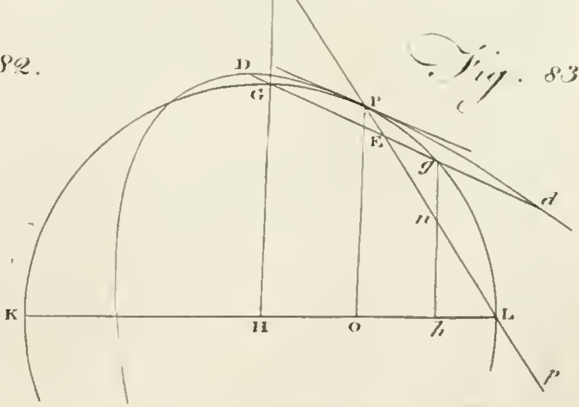
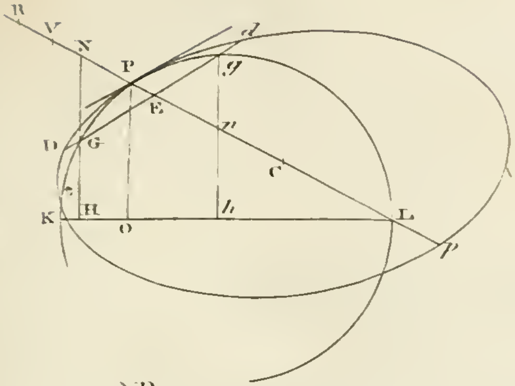


Fig. 83.

A. Bell Prin. Wal. Sculptor fecit.

Fig. 84.



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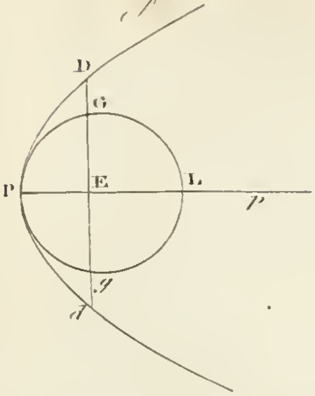


Fig. 86.

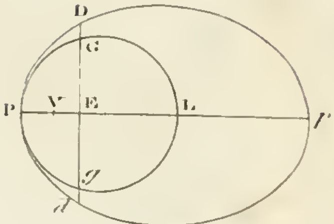


Fig. 88.

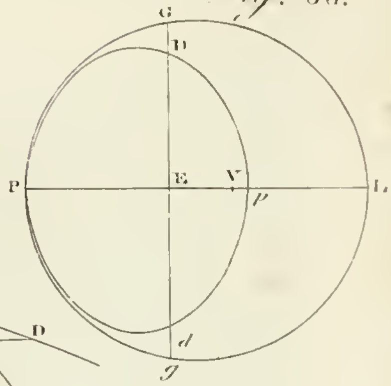


Fig. 87.

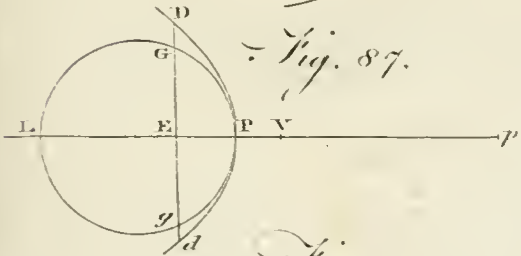


Fig. 89.

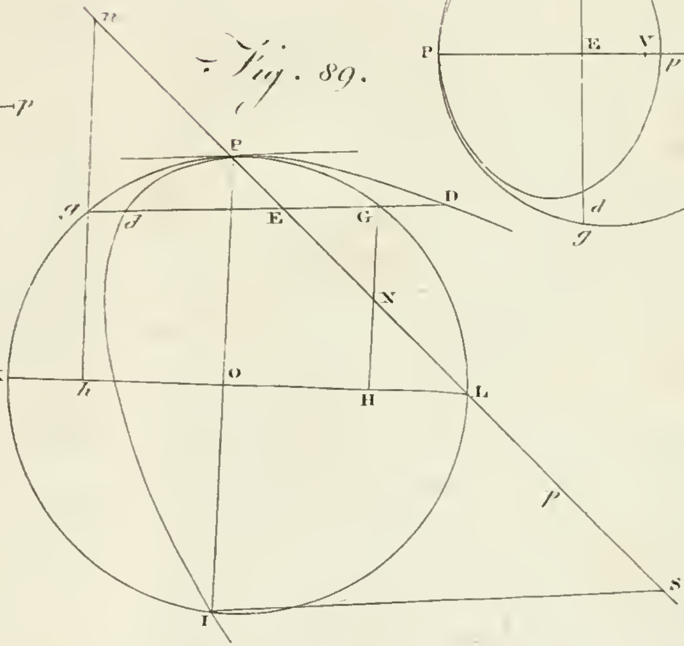


Fig. 91.

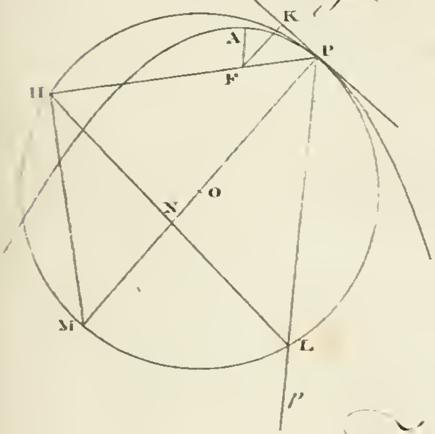


Fig. 92.

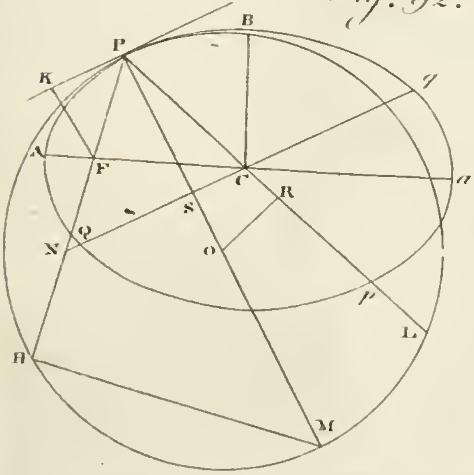
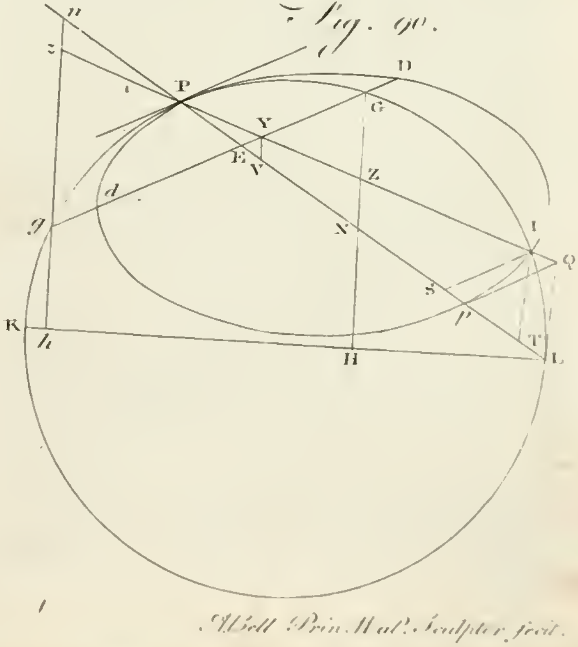


Fig. 90.



A. Bell Prin. Wal. Sculptor fecit.

CONICHTHYODONTES, or Plectronitæ, in *Natural Hiſtory*, a name by which the foſſil teeth of fiſhes are ſometimes diſtinguiſhed.

CONIFERA, in *Botany*, an order of plants in the *Fragmenta methodi naturalis* of Linnæus, containing the following genera, viz. cupreſſus, ephedra, equiſetum, juniperus, pinus, taxus, thuja. See Botany *Index*.

CONIFEROUS trees, ſuch as bear hard dry ſeed-veſſels of a conical figure; conſiſting of ſeveral woody parts, being moſtly ſcaly, adhering cloſe together, and ſeparating when ripe.

CONIMBRICA, in *Ancient Geography*, a town of Luſitania, on the ſouth ſide of the river Monda; from the ruins of which aroſe Coimbra, in its neighbourhood, a city of Portugal. W. Long. 9. 5. N. Lat. 40. 16.

CONINGSECK, a town of Suabia in Germany, and capital of a county of the ſame name, 20 miles north of Conſtance. E. Long. 9. 20. N. Lat. 47. 50.

CONJOINT, in a general ſenſe, ſignifies united or connected.

Conjoint Degrees, in *Muſic*, two notes which follow each other immediately in the order of the ſcale, as *ut* and *re*.

Conjoint Tetrachords, two tetrachords, or fourths, where the ſame chord is the higheſt of one and the loweſt of the other.

CONISSALÆ, an old term in natural hiſtory, ſignifying a claſs of foſſils, which were ſaid to be naturally and eſſentially compounded, not inflammable, nor ſoluble in water, found in detached maſſes, and formed of cryſtalline matter debaſed by earth. It included ſand and gritty ſubſtances.

CONJUGATE diameter, or *Axis of an Ellipſis*, the ſhorteſt of the two diameters, or that biſecting the axis.

CONJUGATION, in *Grammar*, a regular diſtribution of the ſeveral inflections of verbs in their different voices, moods, tenſes, numbers, and perſons, ſo as to diſtinguiſh them from one another. See Grammar and Language.

CONIUM, hemlock. See Botany *Index*.

CONJUNCT, in a general ſenſe, ſignifies conjoined, concurrent, or united.

Conjunct Rights, in *Scots Law*, ſuch as are granted to two or more perſons. See Law *Index*.

Conjunct, or *Confidant Perſons*, in *Scots Law*, ſuch as are about the perſon of another, or employed by him. See Law *Index*.

CONJUNCTION, in *Aſtronomy*, the meeting of two or more ſtars or planets in the ſame degree of the zodiac.

Conjunction, in *Grammar*, an indeclinable word or particle, which ſerves to join words and ſentences together, and thereby ſhows their relation or dependence upon one another. See Grammar.

CONJURATION, magic words, characters, or ceremonies, whereby evil ſpirits, tempeſts, &c. are ſuppoſed to be raiſed, or driven away. The Romiſh prieſts pretend to expel devils, by preparing holy water in a particular manner, and ſprinkling it over the poſſeſſed, with a number of conjurations and exorciſms.

Some authors make the difference between conjuration and witchcraft to conſiſt in this; that the former effects its end by prayers and invocation of God's name, &c. to compel the devil to do what is deſired; ſo that the conjuror is ſuppoſed to be at war with the devil, and that evil ſpirit to act merely out of conſtraint: whereas the latter attains its end by an immediate application to the devil himſelf: and the devil's complaiſance is ſuppoſed to be the conſequence of ſome compact between them, ſo that the devil and the witch have a good underſtanding together. Both theſe, again, differ from inchantment and ſorcery; in that theſe latter operate ſecretly and ſlowly by ſpells, charms, &c. without ever calling on the devil, or having any conference with him.

Conn. See Cond.

CONNAUGHT, one of the four provinces of Ireland, bounded on the eaſt by that of Leinſter, on the weſt by the ocean, on the north and north-weſt by part of the ocean and province of Ulſter, and on the ſouth and eaſt by Munſter. It is about 130 miles in length, and 84 in breadth. It has no rivers of any great note beſides the Shannon. It has ſeveral convenient bays and creeks, and is fertile in many places. It had ſeveral dangerous bogs, overrun with woods, which are now in ſome meaſure cleared away. This province produces abundance of cattle, ſheep, deer, hawks, and honey; but the inhabitants being lazy, it is the leaſt cultivated of all the four provinces. It contains 1 archbiſhopric, 5 biſhoprics, 6 counties, 7 market-towns, 8 places of trade, 10 boroughs that ſend members to parliament, 47,256 houſes, 24 old caſtles, beſides fortreſſes that have been erected of late, and 330 pariſhes. The principal town is Galway.

CONNARUS, Ceylon sumach. See Botany *Index*.

CONNECTICUT, a large river in New England, which gives name to one of the five colonies of that province (ſee the next article). It riſes in a ſwamp on the height of land, in N. Lat. 45. 10. W. Long. 71. After a ſleepy courſe of eight or ten miles, it tumbles over four ſeparate falls, and turning weſt keeps cloſe under the hills which form the northern boundary of the vale through which it runs. The Amonooſuck and Iſrael rivers, two principal branches of Connecticut river, fall into it from the eaſt, between the latitudes 44° and 45°. Between the towns of Walpole on the eaſt, and Weſtminſter on the weſt ſide of the river, are the great falls. The whole river, compreſſed between two rocks ſcarcely 30 feet aſunder, ſhoots with amazing rapidity into a broad baſon below. Over theſe falls, a bridge 160 feet in length was built in 1784, under which the higheſt floods may paſs without detriment. This is the firſt bridge that was ever erected over this noble river. Above Deerfield in Maſſachuſets it receives Deerfield river from the weſt, and Miller's river from the eaſt, after which it turns weſterly in a ſinuous courſe to Fighting-falls, and a little after tumbles over Deerfield falls, which are impaſſable by boats. At Windſor in Connecticut it receives Farmington river from the weſt, and at Hartford meets the tide. From Hartford it paſſes on in a crooked courſe, until it falls into Long Iſland ſound between Saybrook and Lyme.

The length of this river, in a ſtraight line, is nearly 300 miles. Its general courſe is ſeveral degrees weſt of ſouth. It is from 80 to 100 roods wide, 130 miles from its mouth. At its mouth is a bar of ſand which conſiderably obſtructs the navigation. Ten feet water at full tides is found on this bar, and the ſame depth to Middleton. The diſtance of the bar from this place, as the river runs, is 36 miles. Above Middleton are ſeveral ſhoals which ſtretch quite acroſs the river. Only ſix feet water is found on the ſhoal at high tide, and here the tide ebbs and flows but about eight inches. About three miles below Middleton the river is contracted to about 40 roods in breadth by two high mountains. Almoſt everywhere elſe the banks are low, and ſpread into fine extenſive meadows. In the ſpring floods, which generally happen in May, theſe meadows are covered with water. At Hartford the water ſometimes riſes 20 feet above the common ſurface of the river, and having all to paſs through the above-mentioned ſtrait, it is ſometimes two or three weeks before it returns to its uſual bed. Theſe floods add nothing to the depth of water on the bar at the mouth of the river: this bar lying too far off in the ſound to be affected by them.

On this beautiful river, whoſe banks are ſettled almoſt to its ſource, are many pleaſant, neat, well-built towns. On its weſtern bank, from its mouth northward, are the towns of Saybrook, Haddam, Middleton, Weathersfield, Hartford, Windſor, and Suffield, in Connecticut; Weſt Springfield, Northampton, Hatfield, and Deerfield, in Maſſachuſets; Guilford, Brattleborough, in which is Fort Dummer, Weſtminſter, Windſor, Hartford, Fairlee, Newbury, Brunſwick, and many others in Vermont. Croſſing the river into New Hampſhire, and travelling on the eaſtern bank, you paſs through Woodbury nearly oppoſite to Brunſwick, Northumberland, the Coos country, Lyman, Orford, Lyme, Hanover, in which is Dartmouth College, Lebanon, Corniſh, Clermont, Charleſton, or N° 4, Cheſterfield, and many others in New Hampſhire; Sunderland, Hadley, Springfield, Long Meadow, in Maſſachuſets; and in Connecticut, Enfield, Eaſt Windſor, Eaſt Hartford, Glaſtenbury, Eaſt Haddam, and Lyme.

This river is navigable to Hartford, upwards of 50 miles from its mouth, and the produce of the country for 200 miles above is brought thither in boats. The boats which are uſed in this buſineſs are flat-bottomed, long and narrow, for the convenience of going up ſtream, and of ſo light a make as to be portable in carts. They are taken out of the river at three different carrying-places, all of which make 15 miles.

Sturgeon, ſalmon, and ſhad, are caught in plenty in their ſeaſon, from the mouth of the river upwards, excepting ſturgeon, which do not aſcend the upper falls; beſides a variety of ſmall fiſh, ſuch as pike, carp, perch, &c.

From this river are employed three brigs of 180 tons each, in the European trade; and about 60 ſail from 60 to 150 tons, in the Weſt India trade; beſides a few fiſhermen, and 40 or 50 coaſting veſſels.

Connecticut, one of the five ſtates of New England in America; bounded on the north by Maſſachuſets, on the eaſt by Rhode Iſland; on the ſouth by the ſound which divides it from Long Iſland; and on the weſt by the province of New York.

The diviſional line between Connecticut and Maſſachuſets, as ſettled in 1728, was found to be about 72 miles in length. The line dividing Connecticut from Rhode Iſland was ſettled in 1728, and found to be about 45 miles. The ſea coaſt, from the mouth of Paukatuk river, which forms a part of the eaſtern boundary of Connecticut, in a direct ſouthweſtwardly line to the mouth of Bryam river, is reckoned at about 90 miles. The line between Connecticut and New York runs from latitude 41. 0. to latitude 42. 2.; 72 miles. Connecticut contains about 4674 ſquare miles; equal to about 2,960,000 acres.

Rivers.

This ſtate is watered by ſeveral fine rivers, the principal of which are, *Connecticut* deſcribed in the preceding article, Houſatonik, and the Thames. One branch of the Houſatonik riſes in Laneſborough, the other in Windſor, both in Berkſhire county in Maſſachuſets. It paſſes through a number of pleaſant towns, and empties into the ſound between Stratford and Milford. It is navigable 12 miles, to Derby. A bar of ſhells, at its mouth, obſtructs its navigation for large veſſels. In this river, between Saliſbury and Canaan, is a cataract, where the water of the whole river, which is 150 yards wide, falls about 60 feet perpendicularly, in a perfectly white ſheet. A copious miſt ariſes, in which floating rainbows are ſeen in various places at the ſame time, exhibiting a ſcene exceedingly grand and beautiful.

The Thames empties into Long Iſland ſound at New London. It is navigable 14 miles, to Norwich Landing. Here it loſes its name, and branches into Shetucket on the eaſt, and Norwich or Little river on the weſt. The city of Norwich ſtands on the tongue of land between theſe rivers. Little river, about a mile from its mouth, has a remarkable and very romantic cataract. A rock 10 or 12 feet in perpendicular height, extends quite acroſs the channel of the river. Over this the whole river pitches, in one entire ſheet, upon a bed of rocks below. Here the river is compreſſed into a very narrow channel between two craggy cliffs, one of which towers to a conſiderable height. The channel deſcends gradually, is very crooked, and covered with pointed rocks. Upon theſe the water ſwiftly tumbles, foaming with the moſt violent agitation, 15 or 20 rods, into a broad baſon which ſpreads before it. At the bottom of the perpendicular falls, the rocks are curiouſly excavated by the conſtant pouring of the water. Some of the cavities, which are all of a circular form, are five or ſix feet deep. The ſmoothneſs of the water above its deſcent, the regularity and beauty of the perpendicular fall, the tremendous roughneſs of the other, and the craggy, towering cliff which impends the whole, preſent to the view of the ſpectator a ſcene indeſcribably delightful and majeſtic. On this river are ſome of the fineſt mill ſeats in New England, and thoſe immediately below the falls, occupied by Lathrop's mill, are perhaps not exceeded by any in the world. Acroſs the mouth of this river is a broad, commodious bridge, in the form of a wharf, built at a great expence.

Shetucket river, the other branch of the Thames, four miles from its mouth, receives Quinnabog, which has its ſource in Brimfield in Maſſachuſets; thence paſſing through Sturbridge and Dudley in Maſſachuſets, it croſſes into Connecticut, and divides Pomfret from Killingly, Canterbury from Plainfield, and Liſbon from Preſton, and then mingles with Shetucket. In paſſing through this hilly country, it tumbles over many falls, and affords a vaſt number of mill ſeats. The ſource of the Shetucket is not far from that of Quinnabog. It has the name of Willamantik while paſſing through Stafford, and between Tolland and Willington, Coventry and Manſfield. Below Windham it takes the name of Shetucket, and empties as above. Theſe rivers are fed by numberleſs brooks from every part of the adjacent country. At the mouth of Shetucket is a bridge of timber 124 feet in length, ſupported at each end by pillars, and held up in the middle by braces on the top, in the nature of an arch.

2 Harbours. The two principal harbours are at New London and New Haven. The former opens to the ſouth. From the light-houſe, which ſtands at the mouth of the harbour, to the town, is about three miles; the breadth is three quarters of a mile, and in ſome places more. The harbour has from five to ſix fathoms water, a clear bottom, tough ooze, and as far as one mile above the town is entirely ſecure and commodious for large ſhips. New Haven harbour is greatly inferior to that of New London. It is a bay which ſets up northerly from the ſound about four miles. Its entrance is about half a mile wide. It has very good anchorage, and two and a half fathoms at low water, and three fathoms and four feet at common tides. The whole of the ſea coaſt is indented with harbours, many of which are ſafe and commodious, but are not ſufficiently uſed to merit a deſcription.

3 Climate, ſoil, and productions. Connecticut, though ſubject to the extremes of heat and cold in their ſeaſons, and to frequent ſudden changes, is very healthful. As many as one in 46 of the inhabitants of Connecticut, who were living in 1774, were upwards of 70 years old. From accurate calculation it is found, that about one in eight live to the age of 70 years and upwards; one in 13 to the age of 80 years, and one in about 30 to the age of 90.

In the maritime towns the weather is variable, according as the wind blows from the ſea or land. As you advance into the country, the ſea breezes have leſs effect upon the air, and conſequently the weather is leſs variable. The ſhorteſt day is 8 hours and 58 minutes, and the longeſt 15 hours. The north-weſt winds, in the winter-ſeaſon, are often extremely ſevere and piercing, occaſioned by the great body of ſnow which lies concealed from the diſſolving influence of the ſun in the immenſe foreſts north and north-weſt. The clear and ſerene temperature of the ſky, however, makes amends for the ſeverity of the weather, and is favourable to health and longevity. Connecticut is generally broken land, made up of mountains, hills, and valleys; and is exceedingly well watered. Some ſmall parts of it are thin and barren. It lies in the fifth and ſixth northern climates, and has a ſtrong fertile ſoil. Its principal productions are Indian corn, rye, wheat in many parts of the ſtate, oats, and barley, which are heavy and good, and of late buck-wheat, flax in large quantities, ſome hemp, potatoes, of ſeveral kinds, pumpkins, turnips, peaſe, beans, &c. &c. fruits of all kinds, which are common to the climate. The ſoil is very well calculated for paſture and mowing, which enables the farmers to feed large numbers of neat cattle and horſes. Actual calculation has evinced, that any given quantity of the beſt mowing land in Connecticut, produces about twice as much clear profit as the ſame quantity of the beſt wheat land in the ſtate of New York. Many farmers, in the eaſtern part of the ſtate, have lately found their advantage in raiſing mules, which are carried from the ports of Norwich and New London to the Weſt India iſlands, and yield a handſome profit. The beef, pork, butter, and cheeſe, of Connecticut, are equal to any in the world.

4 Trade. The trade of Connecticut is principally with the Weſt India iſlands, and is carried on in veſſels from 60 to 140 tons. The exports conſiſt of horſes, mules, oxen, oak ſtaves, hoops, pine boards, oak planks, beans, Indian corn, fiſh, beef, pork, &c. Horſes, live cattle and lumber, are permitted in the Dutch, Daniſh, and French ports. Beef and fiſh are liable to ſuch heavy duties in the French iſlands, as that little profit ariſes to the merchant who ſends them to their ports. Pork and flour are prohibited. As the ordinance making free ports in the French Weſt India iſlands extends to all foreigners, the price of molaſſes and other articles has been greatly enhanced by the Engliſh purchaſers for Canada and Nova Scotia; ſo that the trade of Connecticut with the French Weſt India iſlands is not profitable. Cotton, cocoa, indigo, and ſugars, are not permitted to be brought away by Americans. The ſeverity with which theſe prohibitory laws are adminiſtered is ſuch, as that theſe articles cannot be ſmuggled.

Connecticut has a large number of coaſting veſſels employed in carrying the produce of the ſtate to other ſtates.—To Rhode Iſland, Maſſachuſets, and New Hampſhire, they carry pork, wheat, corn, and rye. To North and South Carolinas and Georgia, butter, cheeſe, ſalted beef, cyder, apples, potatoes, hay, &c. and receive in return rice, indigo, and money. But as New York is nearer, and the ſtate of the markets always well known, much of the produce of Connecticut, eſpecially of the weſtern parts, is carried there; particularly pot and pearl aſhes, flax-ſeed, beef, pork, cheeſe, and butter in large quantities. Moſt of the produce of Connecticut river, from the parts of Maſſachuſets, New Hampſhire, and Vermont, as well as of Connecticut, which are adjacent, goes to the ſame market. Conſiderable quantities of the produce of the eaſtern parts of the ſtate are marketed at Boſton and Providence.

The value of the whole exported produce and commodities from this ſtate, before the year 1774, was then eſtimated at about 200,000l. lawful money annually. Since this time no accurate eſtimate has been made, ſo that it is impoſſible to tell whether the amount has ſince been increaſed or diminiſhed.

In 1774, the number of ſhipping in Connecticut was 189; their tonnage 10,317; ſeafaring men 1162; beſides upwards of 20 ſail of coaſting veſſels, which employed about 90 ſeamen. This ſtate is not yet fully recovered from the confuſion in which it was involved by the late war; ſo that the number of ſhipping, &c. has not, at any period ſince 1774, been aſcertained with accuracy. It is probable, however, conſidering the loſſes ſuſtained by the war, the decay of the ſhip-building buſineſs, and the number of unfortunate ſhipwrecks,

wrecks, and loſſes by hurricanes in the Weſt Indies, that the ſhipping and ſeamen are not now ſo numerous as in 1774.

5 Manufactures.

The number of ſhipping from the port of New London employed in 1788 in the European and Weſt India trade, was four ſhips, one ſnow, 54 brigantines, 32 ſchooners, and 45 ſloops. The number of horſes and cattle exported from the diſtrict round New London, from the 10th of January 1787, to the 10th of January 1788, was 6917; beſides jack-aſſes imported and exported, not included. From 1786 to 1787, the number was 6671; ſo that the laſt year exceeded the other 246. From March 1787 to January 1788, 1454 horſes, 780 oxen, and 23 cows, were exported from the port of Middleton.

The farmers in Connecticut and their families are moſtly clothed in plain, decent, homeſpun cloth. Their linens and woollens are manufactured in the family way; and although they are generally of a coarſer kind, they are of a ſtronger texture, and much more durable, than thoſe imported from France and Great Britain. Many of their cloths are fine and handſome.

In New Haven is a linen manufactory which flouriſhes, and one for cotton is about to be eſtabliſhed. In Eaſt Hartford is a glaſs-work, a ſnuff and powder mill, and an iron-work and ſlitting mill. Iron-works are eſtabliſhed alſo at Saliſbury, Norwich, and other parts of the ſtate. At Stafford is a furnace at which are made large quantities of hollow ware and other ironmongery, ſufficient to ſupply the whole ſtate. Paper is manufactured at Norwich, Hartford, New Haven, and in Litchfield county. Nails of every ſize are made in almoſt every town and village in Connecticut; ſo that conſiderable quantities can be exported to the neighbouring ſtates, and at a better rate than they can be had from Europe. Ironmongery, hats of the beſt kinds, candles, leather, ſhoes, and boots, are manufactured in this ſtate. We muſt not omit to mention wooden diſhes and other wooden ware, which are made in vaſt quantities in Suffield and ſome few other places, and ſold in almoſt every part of the eaſtern ſtates. Oil mills, of a new and very ingenious conſtruction, have been erected in ſeveral parts of the ſtate.

It appears from experiments made formerly in this ſtate, that a buſhel of ſun-flower ſeed yields a gallon of oil; and that an acre of ground planted with the ſeed at three feet apart, will yield between forty and fifty buſhels of the ſeed. This oil is as mild as ſweet oil, and is equally agreeable with ſalads, and as a medicine. It may, moreover, be uſed with advantage in paints, varniſhes, and ointments. From its being manufactured in our own country, it may always be procured and uſed in a freſh ſtate. The oil is preſſed from the ſeed in the ſame manner that cold-drawn linſeed oil is drawn from flax-ſeed, and with as little trouble. Sweet olive oil ſells for ſix ſhillings a quart. Should the oil of the ſun-flower ſell for only two-thirds of that price, the produce of an acre of ground, ſuppoſing it to yield only 40 buſhels of the ſeed, will be 32l. a ſum far beyond the product of an acre of ground in any kind of grain. The ſeed is raiſed with very little trouble, and grows in land of moderate fertility. It may be gathered and ſhelled, fit for the extraction of the oil, by women and children.

6 Civil diviſions and population.

Connecticut is divided into eight counties, viz. Hartford, New Haven, New London, Fairfield, Windham, Litchfield, Middleſex, and Tolland. The counties are ſubdivided into upwards of 80 townſhips; each of which is a corporation, inveſted with power to hold lands, chooſe their own town-officers, to make prudential laws, the penalty of tranſgreſſion not to exceed 20s. and to chooſe their own repreſentatives to the general aſſembly. The townſhips are generally divided into two or more pariſhes, in each of which is one or more places of public worſhip.

Connecticut is the moſt populous, in proportion to its extent, of any of the thirteen ſtates. It is laid out in ſmall farms from 50 to 300 or 400 acres each, which are held by the farmers in fee-ſimple; and are generally cultivated as well as the nature of the ſoil will admit. The ſtate is chequered with innumerable roads or highways, croſſing each other in every direction. A traveller in any of theſe roads, even in the moſt unſettled parts of the ſtate, will ſeldom paſs more than two or three miles without finding a houſe or cottage, and a farm under ſuch improvements as to afford the neceſſaries for the ſupport of a family. The whole ſtate reſembles a well-cultivated garden; which, with that degree of induſtry that is requiſite for happineſs, produces the neceſſaries and conveniences of life in great plenty.

In 1759, the number of inhabitants in Connecticut was 130,611; in 1774, there were 197,856 ſouls. In 18 years, the increaſe was 67,245; from 1774 to 1782, the increaſe was but 11,294 perſons. This comparatively ſmall increaſe of inhabitants may be ſatisfactorily accounted for from the deſtruction of the war, and the numerous emigrations to Vermont, the weſtern parts of New Hampſhire, and other ſtates.

The inhabitants are almoſt entirely of Engliſh deſcent. There are no Dutch, French, or Germans, and very few Scotch or Iriſh people, in any part of New England.

7 Character, manners, &c.

In addition to what has been already ſaid on theſe particulars under New England, it may be obſerved, that the people of Connecticut are remarkably fond of having all their diſputes, even thoſe of the moſt trivial kind, ſettled according to law. The prevalence of this litigious ſpirit affords employment and ſupport for a numerous body of lawyers. The number of actions entered annually upon the ſeveral dockets in the ſtate, juſtifies the above obſervations. That party ſpirit, however, which is the bane of political happineſs, has not raged with ſuch violence in this ſtate as in Maſſachuſets and Rhode Iſland. Public proceedings have been conducted, generally, and eſpecially of late, with much calmneſs and candour. The people are well informed in regard to their rights, and judicious in the methods they adopt to ſecure them.

The clergy, who are numerous, and, as a body, very reſpectable, have hitherto preſerved a kind of ariſtocratical balance in the very democratical government of the ſtate; which has happily operated as a check upon the overbearing ſpirit of republicaniſm. It has been lamented that the unhappy religious diſputes

Connecticut.

putes which have too much prevailed among ſome of the clergy, and the too great attention that others have paid to their temporal concerns, to the neglect of their flocks, and an inattention to the qualifications of thoſe who have been admitted to the ſacred office, have, heretofore, conſiderably diminiſhed their influence. It is a pleaſing circumſtance that the rage for theological diſputation is abating; and greater ſtrictneſs is obſerved in the admiſſion of candidates to the miniſtry. Their influence is on the increaſe; and it is no doubt to be attributed, in part, to their increaſing influence, that an evident reformation in the manners of the people of this ſtate has taken place ſince the peace. In regard to learning and abilities, the clergy, at the preſent day, are equal to their predeceſſors at any former period.

8 Religion. As to eccleſiaſtical government and diſcipline, each church is a ſeparate juriſdiction, and claims authority to chooſe their own miniſter, to exerciſe government, and to enjoy goſpel ordinances within itſelf. The churches, however, are not independent of each other; they are aſſociated for mutual benefit and convenience. The aſſociations have power to licenſe candidates for the miniſtry, to conſult for the general welfare, and to recommend meaſures to be adopted by the churches, but have no authority to enforce them. When diſputes ariſe in churches, councils are called, by the parties, to ſettle them; but their power is only adviſory. There are as many aſſociations in the ſtate as there are counties; and they meet twice in a year. Theſe are all combined in one general aſſociation, who meet annually.

All religions that are conſiſtent with the peace of ſociety are tolerated in Connecticut; and a ſpirit of liberality and catholiciſm is increaſing. There are very few religious ſects in this ſtate; the bulk of the people are Congregationaliſts. Beſides theſe there are Epiſcopalians and Baptiſts; and formerly there was a ſociety of Sandimanians at New-Haven; but they are now reduced to a very ſmall number. The Epiſcopalian churches are reſpectable, and are under the ſuperintendance of a biſhop. There were 29 congregations of the Baptiſts in 1784. Theſe congregations, with thoſe in the neighbouring ſtates, meet in aſſociations, by delegation, annually.

9 Chief towns. There are a great number of very pleaſant towns, both maritime and inland, in Connecticut. It contains five incorporated towns or cities. Two of theſe, Hartford and New-Haven, are the capitals of the ſtate. The general aſſembly is holden at the former in May, and at the latter in October, annually. See HARTFORD and *New-Haven*.

10 Colleges, academies, and ſchools. In no part of the world is the education of all ranks of people more attended to than in Connecticut. Almoſt every town in the ſtate is divided into diſtricts, and each diſtrict has a public ſchool kept in it a greater or leſs part of every year. Somewhat more than one third of the money ariſing from a tax on the polls and rateable eſtate of the inhabitants, is appropriated to the ſupport of ſchools, in the ſeveral towns, for the education of children and youth. The law directs that a grammar ſchool ſhall be kept in every country town through the ſtate.

There is a grammar ſchool at Hartford, and another at New-Haven, ſupported by a donation of Governor Hopkins. This venerable and benevolent gentleman, in his laſt will, dated 1657, left in the hands of Theophilus Eaton, Eſq. and three others, a legacy of 1324l. "as an encouragement, in theſe foreign plantations, of breeding up hopeful youths both at the grammar ſchool and college." In 1664, this legacy was equally divided between New-Haven and Hartford; and grammar ſchools were erected, which have been ſupported ever ſince.

At Greenfield there is a reſpectable academy, under the care and inſtruction of the Rev. Dr Dwight. At Plainfield is another, under the care of the Rev. Mr Benedict. This academy has flouriſhed for ſeveral years, and furniſhed a number of ſtudents for Yale and Dartmouth colleges. At Norwich and Windham, likewiſe, are academies furniſhed with able inſtructors; each of theſe academies has 60 or 70 ſcholars.

Yale College was founded in 1700, and remained at Killingworth until 1707—then at Saybrook until 1716, when it was removed and fixed at New-Haven. See *New-Haven*.

11 Mines, minerals and foſſils. On the bank of Connecticut river, two miles from Middleton, is a lead mine, which was wrought during the war, at the expence of the ſtate, and was productive. It is too expenſive to work in time of peace. Copper mines have been diſcovered and opened in ſeveral parts of the ſtate, but have proved unprofitable, and are much neglected. Iron mines are numerous and productive. Steel ore has been found in the mountains between Woodbury and New Milford. Talcs of various kinds, white, brown, and chocolate coloured cryſtals, zinc or ſpeltzer, a ſemimetal, and ſeveral other foſſils and metals, have been found in Connecticut.

12 Mode of levying taxes. All freeholders in the ſtate are required by law to give in liſts of their polls and rateable eſtate, to perſons appointed in the reſpective towns to receive them, on or before the 20th of Auguſt annually. Theſe are valued according to law, arranged in proper order, and ſent to the general aſſembly annually in May.

The ſum total of the liſt of the polls and rateable eſtate of the inhabitants of Connecticut, as brought into the general aſſembly in May 1787, were as follows:

Sum total of the ſingle liſt	L.1,484.901	6	4¾
Aſſeſſments	47,790	2	9
One quarter of the fourfolds	1,176	9	4
Total	L.1,533,867	18	5¾

On this ſum taxes are levied, ſo much on the pound, according to the ſum propoſed to be raiſed. A tax of two-pence on the pound would raiſe 12,782l. 4s.

The ordinary annual expences of government before the war amounted to near 4000l. ſterling, excluſive of that which was appropriated to the ſupport of ſchools. The expences have ſince increaſed.

13 Mineral ſprings. At Stafford is a medicinal ſpring, which is ſaid to be a ſovereign remedy for ſcorbutic, cutaneous, and other diſorders. At Guilford is a ſpring, whoſe water, it is ſaid, when ſeparated from the fountain, will evaporate even when put into a bottle and tightly corked.

It is difficult to ſay what is the conſtitution of this

14 Conſtitution and courts of juſtice.

ſtate. Contented with the form of government which originated from the charter of Charles II. granted in 1662, the people have not been diſpoſed to run the hazard of framing a new conſtitution ſince the declaration of independence. They have tacitly adopted their old charter as the ground of civil government, ſo far as it is applicable to an independent people.

Agreeable to this charter, the ſupreme legiſlative authority of the ſtate is veſted in a governor, deputy-governor, twelve aſſiſtants or counſellors, and the repreſentatives of the people, ſtyled the *General Aſſembly*. The governor, deputy-governor, and aſſiſtants, are annually choſen by the freemen in the month of May. The repreſentatives (their number not to exceed two from each town) are choſen by the freemen twice a-year, to attend the two annual ſeſſions, on the ſecond Thurſday of May and October. This aſſembly has power to erect judicatories, for the trial of cauſes civil and criminal, and to ordain and eſtabliſh laws for ſettling the forms and ceremonies of government. By theſe laws the general aſſembly is divided into two branches, called the upper and lower houſes. The upper houſe is compoſed of the governor, deputy-governor, and aſſiſtants; the lower houſe, of the repreſentatives of the people. No law can paſs without the concurrence of both houſes. The judges of the ſuperior court hold their offices during the pleaſure of the general aſſembly. The judges of the county courts, and juſtices, are annually appointed. Sheriffs are appointed by the governor and council, without limitation of time. The governor is captain-general of the militia, the deputy-governor lieutenant-general. All other military officers are appointed by the aſſembly, and commiſſioned by the governor.

The mode of electing the governor, deputy-governor, aſſiſtants, treaſurer, and ſecretary, is as follows: The freemen in the ſeveral towns meet on the Monday next after the firſt Tueſday in April, annually, and give in their votes for the perſons they chooſe for the ſaid offices reſpectively, with their names written on a piece of paper, which are received and ſealed up by a conſtable in open meeting, the votes for each office by themſelves, with the name of the town and office written on the outſide. Theſe votes, thus ſealed, are ſent to the general aſſembly in May, and there counted by a committee from both houſes. All freemen are eligible to any office in government. In chooſing aſſiſtants, twenty perſons are nominated, by the vote of each freeman, at the freemen's meeting for chooſing repreſentatives in September annually. Theſe votes are ſealed up, and ſent to the general aſſembly in October, and are there counted by a committee of both houſes, and the twenty perſons who have the moſt votes ſtand in nomination; out of which number the twelve who have the greateſt number of votes, given by the freemen at their meeting in April, are in May declared aſſiſtants in the manner above mentioned. The qualifications of freemen are, maturity in years, quiet and peaceable behaviour, a civil converſation, and freehold eſtate to the value of forty ſhillings per annum, or forty pounds perſonal eſtate in the liſt, certified by the ſelect men of the town; it is neceſſary alſo that they take the oath of fidelity to the ſtate. Their names are enrolled in the town clerk's office, and they continue freemen for life, unleſs disfranchiſed by ſentence of the ſuperior court, on conviction of miſdemeanor.

The courts are as follows: The juſtices of the peace, of whom a number are annually appointed in each town by the general aſſembly, have authority to hear and determine civil actions, where the demand does not exceed four pounds. If the demand exceeds forty ſhillings, an appeal to the county is allowed. They have cognizance of ſmall offences, and may puniſh by fine not exceeding forty ſhillings, or whipping not exceeding ten ſtripes, or ſitting in the ſtocks. There are eight county courts in the ſtate, held in the ſeveral counties by one judge and four juſtices of the quorum, who have juriſdiction of all criminal caſes, ariſing within their reſpective counties, where the puniſhment does not extend to life, limb, or baniſhment. The have original juriſdiction of all civil actions which exceed the juriſdiction of a juſtice. Either party may appeal to the ſuperior court, if the demand exceeds twenty pounds, except on bonds or notes vouched by two witneſſes.

There are ſeveral courts of probate in each county, conſiſting of one judge. The peculiar province of this court, is, the probate of wills, granting adminiſtration of inteſtate eſtates, ordering diſtribution of them, and appointing guardians for minors, &c. An appeal lies from any decree of this court to the ſuperior court.

The ſuperior court conſiſts of five judges. It has authority in all criminal caſes extending to life, limb or baniſhment, and other high crimes and miſdemeanors, to grant divorces, and to hear and determine all civil actions brought by appeal from the county courts, or the court of probate, and to correct the errors of all inferior courts. This is a circuit court, and has two ſtated ſeſſions in each county annually. The ſuperior and county courts try matters of fact by a jury, or without if the parties will agree.

There is a ſupreme court of errors, conſiſting of the deputy-governor and the twelve aſſiſtants. Their ſole buſineſs is to determine writs of error brought on judgments of the ſuperior court, where the error complained of appears on the record. They have two ſtated ſeſſions annually, viz. on the Tueſdays of the weeks preceding the ſtated ſeſſions of the general aſſembly.

The county court is a court of chancery, empowered to hear and determine caſes in equity, where the matter in demand does not exceed one hundred pounds. The ſuperior court has cognizance of all caſes where the demand exceeds that ſum. Error may be brought from the county to the ſuperior court, and from the ſuperior court to the ſupreme court of errors, on judgment in caſes of equity as well as of law.

The general aſſembly only have power to grant pardons and reprieves, to grant commiſſions of bankruptcy, or protect the perſons and eſtates of unfortunate debtors.

The common law of England, ſo far as it is applicable to this country, is conſidered as the common law of this ſtate. The reports of adjudication in the courts of king's bench, common pleas, and chancery, are read in the courts of this ſtate as authorities; yet the judges do not conſider them as concluſively binding,

ing, unleſs founded on ſolid reaſons which will apply in this ſtate, or ſanctioned by concurrent adjudications of their own courts.

The feudal ſyſtem of deſcents was never adopted in this ſtate. All the real eſtate of inteſtates is divided equally among the children, males and females, except that the eldeſt ſon has a double portion. And all eſtates given in tail muſt be given to ſome perſon then in being, or to their immediate iſſue, and ſhall become fee-ſimple eſtates to the iſſue of the firſt donee in tail. The widow of an inteſtate is entitled to a third part of the perſonal eſtate for ever, and to her dower, or third part of the houſes and lands belonging to the inteſtate at the time of his death, during her life.

15 Practice of law. The practice of law in this ſtate has more ſimplicity, but leſs preciſion, than in England. Aſſiſtants and judges are empowered to iſſue writs through the ſtate, and juſtices through their reſpective counties. In theſe writs, the ſubſtance of the complaints or the declarations muſt be contained; and if neither of the parties ſhow good reaſon for delay, the cauſes are heard and determined the ſame term to which the writs are returnable. Few of the fictions of law, ſo common in the Engliſh practice, are known in this ſtate. The plaintiff always has his election to attach or ſummon the defendant. Attorneys are admitted and qualified by the county courts. Previous to their admiſſion to the bar, they muſt ſtudy two years with a practiſing attorney in the ſtate, if they have had a college education, and three years if they have not; their morals muſt be good, and their characters unblemiſhed; and they muſt ſuſtain an examination by the attorneys of the court of the county where they are admitted, and be by them recommended to the court. When admitted to the county court, they can practiſe, without other qualifications, in any court in the ſtate. There are upon an average about thirteen attorneys to each county, one hundred and four in the ſtate; a very great proportion for the real exigencies of the people. Yet from the litigious ſpirit of the citizens, the moſt of them find employment and ſupport. There is no attorney general, but there is one attorney to the ſtate in each county.

16 Hiſtory. The preſent territory of Connecticut, at the time of the firſt arrival of the Engliſh, was poſſeſſed by the Pequot, the Mohegan, Podunk, and many other ſmaller tribes of Indians.

The Pequots were numerous and warlike. Their country extended along the ſea-coaſt from Paukatuk to Connecticut river. About the year 1630, this powerful tribe extended their conqueſts over a conſiderable part of Connecticut, over all Long Iſland, and part of Narraganſett. Saſſacus, who was the grand monarch of the whole country, was king of this nation. The ſeat of his dominions was at New-London; the ancient Indian name of which was Pequot.

The Mohegans were a numerous tribe, and their territory extenſive. Their ancient claim, which was ſurveyed and ſettled by commiſſioners from Queen Anne in 1705, comprehended all New London county, except a narrow ſtrip of about eight miles wide, on the ſea-coaſt, almoſt the whole of the county of Windham, and a part of the counties of Tolland and Hartford. Uncas, diſtinguiſhed for his friendſhip to the Engliſh, was the ſachem of this tribe.

The Podunks inhabited Eaſt Hartford, and the circumjacent country. The firſt ſachem of this tribe, of whom the Engliſh had any knowledge was Tatanimoo. He was able to bring into the field more than 200 fighting men.

The firſt grant of Connecticut was made by the Plymouth council to the earl of Warwick, in 1630, and confirmed by his majeſty in council the ſame year. This grant comprehended all that part of New England which lies weſt from Narraganſett river, 120 miles on the ſea-coaſt, from thence, in latitude and breadth aforeſaid, to the South ſea. The year following, the earl aſſigned this grant to Lord Say and Seal, Lord Brook, and nine others.

No Engliſh ſettlements were attempted in Connecticut until the year 1633, when a number of Indian traders, having purchaſed of Zequaſſon and Natawanute, two principal ſachems, a tract of land at the mouth of Little river in Windſor, built a houſe and fortified it, and ever after maintained their right of ſoil upon the river.

The ſame year, a little before the arrival of the Engliſh, a company of Dutch traders came to Hartford, and built a houſe which they called the *Hirſe of Good Hope*, and erected a ſmall fort, in which they planted two cannon. The remains of this ſettlement are ſtill viſible on the bank of Connecticut river. This was the only ſettlement of the Dutch in Connecticut in theſe ancient times. The Dutch, and after them the province of New York, for a long time claimed as far eaſt as the weſtern bank of Connecticut river. It belongs to the profeſſed hiſtorian to prove or diſprove the juſtice of this claim. Douglas ſays, "The partition line between New York and Connecticut, as eſtabliſhed December 1. 1664, runs from the mouth of Memoroncok river, a little weſt of Byram river, N. N. W. and was the ancient eaſterly limits of New York, until November 23. 1683, when the line was run nearly the ſame as it is now ſettled." If Douglas is right, the New York claim could not have been well founded.

In 1634, Lord Say and Seal, &c. ſent over a ſmall number of men, who built a fort at Saybrook, and held a treaty with the Pequot Indians, who in a formal manner gave to the Engliſh their right to Connecticut river and the adjacent country.

In 1635, the Plymouth council granted to the duke of Hamilton, all lands between Narraganſett and Connecticut rivers, and back into the country as far as Maſſachuſets ſouth line. This covered a part of the earl of Warwick's patent, and occaſioned ſome diſputes in the colony. There were ſeveral attempts to revive the Hamilton claim, but they were never proſecuted.

In October of this year, about ſixty perſons from Newton, Dorcheſter, and Watertown, in Maſſachuſets, came and ſettled at Hartford, Wethersfield, and Windſor, in Connecticut; and the June following the famous Mr Hooker and his company came and ſettled at Hartford, and was a friend and father to the colony to the day of his death.

The firſt court held in Connecticut was at Hartford, April 26. 1636.

The year 1637 was diſtinguiſhed by the war with the Pequots. This warlike nation had, for ſome time, been troubleſome neighbours. They ſolicited the Nar-

Connecticut.

raganſetts to join them in extirpating the Engliſh. They had ſurpriſed and killed ſeveral of the Engliſh upon Connecticut river. Theſe threatening appearances and actual hoſtilities induced the three colonies of Maſſachuſets, Plymouth, and Connecticut, to combine their forces, to carry the war into their country, and to attempt the entire deſtruction of the whole tribe. Myantonomo, the Narranganſett ſachem, and Uncas, ſachem of the Mohegans, ſent to the Engliſh and offered their ſervice to join with them againſt the Pequots. Forces were accordingly raiſed in all the colonies; but thoſe of Connecticut, on account of their vicinity to the enemy, were firſt in action. Captain Maſon, with 80 Engliſh and 100 Indians from Connecticut river, proceeded by water to the Narraganſetts country, where 200 of that tribe joined him. On the 24th of May, they began their March for Saſſacus fort on Pequot, now Thames river. They afterwards determined firſt to aſſault Myſtic fort, which was ſituated between them and Pequot river. On the morning of the 26th of May the attack was made. The Indians, after a midnight revel, were buried in a deep ſleep. At the moment of their approach, the centinel happened to be gone into a wigwam to light his pipe. The barking of a dog gave the alarm. The Indians awoke, ſeized their arrows and began their hideous yell. They were joined in their tremendous noiſe by the Indians in the Engliſh army, who were in the rear and afraid to approach. The battle was warm and bloody, and the victory complete. The fort was taken—about 70 wigwams burnt—50 or 60 of the Indians were killed—many were wounded and taken, and the reſt eſcaped. Saſſacus and his warriors at Pequot, ſtruck with terror at the news of this defeat, demoliſhed their principal fort, burnt their wigwams, and fled to the weſtward. Captain Stoughton, with 160 men from Maſſachuſets, had by this time arrived at Saybrook. He with his forces joined Captain Maſon and purſued the Indians, and overtook and ſurrounded them in a great ſwamp near Fairfield. A ſachem and 99 women and children came out and delivered themſelves up to their purſuers. Terms of peace were offered to the reſt: but after a ſhort parley they determined, that as they had lived they would die together. There were about 80 who made this reſolution. Part of theſe eſcaped by means of the darkneſs of the night. The reſt were either killed or taken. In this action the Indians had guns, which is the firſt account of their having uſed them. Saſſacus fled to the Mohawks, by whom it is reported he was murdered; but it is more probable that he and his company incorporated with them. Many of the Indian captives were unjuſtifiably ſent to Bermudas and ſold for ſlaves. The Pequot tribe was wholly extinguiſhed. This ſucceſsful expedition ſtruck the Indians that remained with ſuch terror, as reſtrained them from open hoſtilities for near forty years after.

The Engliſh thus obtained the country eaſt of the Dutch ſettlements, by right of conqueſt. The purſuit of the Indians led to an acquaintance with the lands on the ſea-coaſt from Saybrook to Fairfield. It was reported to be a very fine country. This favourable report induced Meſſrs Eaton and Hopkins, two very reſpectable London merchants, and Mr Davenport, a man of diſtinguiſhed piety and abilities, with their company, who arrived this year (1637) from London, to think of this part of the country as the place of their ſettlement. Their friends in Maſſachuſets, ſorry to part with ſo valuable a company, diſſuaded them from their purpoſe. Influenced, however, by the promiſing proſpects which the country afforded, and flattering themſelves that they ſhould be out of the juriſdiction of a general governor, with which the country was from time to time threatened, they determined to proceed. Accordingly, in March 1638, with the conſent of their friends on Connecticut river, they ſettled at New Haven, and laid the foundation of a flouriſhing colony, of which Quinnipiak, now New Haven, was the chief town. The firſt public worſhip, in this new plantation, was attended on Lord's day, April 18. 1638, under a large ſpreading oak. The Rev. Mr Davenport preached from Mat. iii. 1. on the temptations of the wilderneſs. Both colonies, by voluntary compact, formed themſelves into diſtinct commonwealths, and remained ſo until their union in 1665.

In 1639, the three towns on Connecticut river, already mentioned, finding themſelves without the limits of any juriſdiction, formed themſelves into a body politic, and agreed upon articles of civil government. Theſe articles were the foundation of Connecticut charter, which was granted in 1662. The ſubſtance of the articles, ſo far as they reſpect the holding of aſſemblies, the time and manner of electing magiſtrates and other civil officers (except that in the old confederation no perſon was to be choſen governor more than once in two years), and the extent of legiſlative powers, was transferred into, and eſtabliſhed in ſaid charter.

The firſt church was gathered in New Haven this year, and conſiſted of ſeven members. Theſe were choſen by the ſettlers after Mr Davenport had preached from the words of Solomon, 'Wiſdom hath builded her houſe, ſhe hath hewed out her ſeven pillars.' Theſe men were indeed the pillars of the church, to whom the reſt were added as they became qualified. They were alſo the court to try all civil actions.

The firſt ſettlers in New Haven had all things common; all purchaſes were made in the name and for the uſe of the whole plantation; and the lands were apportioned out to each family, according to their number and original ſtock.

At their firſt election, in October 1639, Mr Theophilus Eaton was choſen governor for the firſt year. Their elections, by agreement, were to be annual; and the word of God their only rule in conducting the affairs of government in the plantation.

In 1643, the articles of confederation between the four New England colonies, mentioned under the article New England, were unanimouſly adopted by the colonies of New Haven and Connecticut.

The Engliſh ſettlement on Delaware, which was under the juriſdiction of New Haven, was ſurpriſed by the Swedes, and the people put in irons, under a falſe pretence that they were entering into a conſpiracy with the Indians to extirpate the Swedes.

The general court of New Haven, this year, eſtabliſhed it as a fundamental article not to be diſputed, That none be admitted as free burgeſſes but church members, and that none but ſuch ſhould vote at elections.

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tions. They alſo ordained, That each town chooſe from among themſelves judges (church members) to be a court, to have cognizance of all civil actions not exceeding twenty pounds; and of criminal cauſes, where the puniſhment was ſitting in the ſtocks, whipping, and fining not exceeding five pounds. There was liberty of appeal from this to the court of magiſtrates. The court of magiſtrates conſiſted of all the magiſtrates throughout the colony, who were to meet twice a-year at New Haven, for the trial of all capital cauſes. Six made a quorum. The general court was to conſiſt of the governor, deputy-governor, magiſtrates, and two repreſentatives from each town. The annual election of officers of government was at this time eſtabliſhed, and has ever ſince continued.

The unſettled ſtate of the colony had hitherto prevented their eſtabliſhing a code of laws. To ſupply this defect, the general court ordered, 'That the judicial laws of God, as they were delivered to Moſes, and as they are a fence to the moral, being neither typical nor ceremonial, nor having any reference to Canaan, ſhall be accounted of moral equity, and generally bind all offenders, and be a rule to all the courts in this juriſdiction in their proceedings againſt offenders, until they be branched out into particulars hereafter.'

About this time a war broke out between the Mohegan and Narraganſett Indians. A perſonal quarrel between Myantonomo ſachem of the Narraganſetts, and Uncas ſachem of the Mohegans, was the foundation of the war. Myantonomo raiſed an army of 900 warriors, and marched towards the Mohegan country. Uncas by his ſpies received timely notice of their approach. His ſeat of reſidence was in ſome part of Norwich. He quickly collected 600 of his braveſt warriors, and told them, 'The Narraganſetts muſt not come into our town; we muſt meet them.' They accordingly marched about three miles to a large plain, where the two armies met, and halted within bow-ſhot of each other. A parley was propoſed by Uncas, and agreed to by Myantonomo. The ſachems met, and Uncas addreſſed his enemy as follows. 'You have a great many brave men: ſo have I. You and I have quarrelled; but theſe warriors, what have they done? Shall they die to avenge a private quarrel between us? No. Come like a brave man, as you pretend to be, and let us fight. If you kill me, my men ſhall be your's; if I kill you, your men ſhall be mine.' Myantonomo replied: 'My men came to fight, and they ſhall fight.' Uncas, like an experienced warrior, aware of the reſult of the conference from the ſuperior force of his enemy, had previouſly ſignified to his men, that if Myantonomo refuſed to fight him in ſingle combat, he would immediately fall, which was to be the ſignal for them to begin the attack. As ſoon therefore as Myantonomo had finiſhed his laconic ſpeech, Uncas dropped: his men inſtantly obeyed the ſignal, and poured in a ſhower of arrows upon the unſuſpecting Narraganſetts, and ruſhing on with their horrid yells and ſavage fierceneſs, put them to flight. Many were killed on the ſpot, the reſt were cloſely purſued, and ſome were precipitately driven down craggy precipices, and daſhed in pieces. At a place called, from this event, *Sachem's plain*, Uncas overtook and ſeized Myantonomo by the ſhoulder. They ſat down together; and Uncas with a hoop called in his men, and the battle ceaſed. Doubtful what to do with the royal priſoner, Uncas and his warriors, in council, determined to carry him to the governor and council at Hartford, and be adviſed by them. Thither he was accordingly conducted. The governor having adviſed with his council, told Uncas, that the Engliſh were not then at war with the Narraganſetts, and of courſe that it was not proper for them to intermeddle in the matter. Uncas was left to do with him as he pleaſed. Myantonomo was conducted back to the plain where he was taken, and put to death by Uncas himſelf. The tragic ſcene did not end with his death. Uncas, after the manner of the Indians, with his tomahawk cut off a large piece of fleſh from the ſhoulder of his ſlaughtered enemy, broiled and ate it, ſaying, with an air of ſavage triumph, 'It is the ſweeteſt meat I ever ate. It makes me have a ſtout heart.' His body was afterwards buried, and a pillar erected over it, the remains of which are viſible to this day.

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The Narraganſetts were greatly enraged at the death of their prince, and reſolved to take vengeance on the Mohegans. The united colonies interpoſed to prevent a war between them, but in vain. The Narraganſetts reſolutely declared, they would continue the war until they had Uncas's head. But as Uncas had ever been a friend to the Engliſh, they joined him againſt his enemies, and were victorious. Such, however, was the enmity of the Narraganſetts to the Engliſh, that they afterwards ſent ſome of their men to Uncas, with large preſents, to induce him to join with them in a war with the colonies. Uncas replied. "Go tell your king, that I will go to Norwich, and adviſe with Major John Maſon and Mr Fitch; if they tell me to join him and fight againſt the Engliſh, I will join him." In the war that happened ſoon after, Uncas aſſiſted the Engliſh, and the Narraganſetts were ſubdued, and never after were formidable.

In conſideration of the ſucceſs and increaſe of the New England colonies, and that they had been of no charge to the nation, and in proſpect of their being in future very ſerviceable to it, the Engliſh parliament, March 10. 1643, granted them an exemption from all cuſtoms, ſubſidies, and other duties, until further order.

In 1644, the Connecticut adventurers purchaſed of Mr Fenwick, agent for Lord Say and Seal, and Lord Brook, their right to the colony of Connecticut, for 1600l.

The hiſtory of Connecticut is marked with traces of the ſame ſpirit which has been mentioned as characteriſtic of the Maſſachuſſets, in different ſtages of their hiſtory. Indeed, as Maſſachuſets was the ſtock whence Connecticut proceeded, this is to be expected.

The colonies of Connecticut and New Haven, from their firſt ſettlement, increaſed rapidly: tracts of land were purchaſed of the Indians, and new towns ſettled from Stamford to Stonington, and far back into the country, when, in 1761, Major John Maſon, as agent for the colony, bought of the natives all lands which had not before been purchaſed by particular towns, and made a public ſurrender of them to the colony, in the preſence of the general aſſembly. Having done theſe things, the colonies petitioned King Charles II.

for a charter, and their petition was granted. His majeſty, on the 23d of April 1662, iſſued his letters patent under the great ſeal, ordaining that the colony of Connecticut ſhould for ever hereafter be one body corporate and politic, in fact and in name, confirming to them their ancient grant and purchaſe, and fixing their boundaries as follows, viz. "All that part of his Majeſty's dominions in New England, in America, bounded eaſt by Narraganſett river, commonly called *Narraganſett bay*, where the river falleth into the ſea; and on the north by the line of Maſſachuſets plantation, and on the ſouth by the ſea, and in longitude as the line of the Maſſachuſets colony, running from eaſt to weſt, that is to ſay, from the ſaid Narraganſett bay on the eaſt, to the South ſea on the weſt part, with the iſlands thereunto belonging." This charter has ever ſince remained the baſis of the government of Connecticut.

Such was the ignorance of the Europeans reſpecting the geography of America, when they firſt aſſumed the right of giving away lands which the God of nature had long before given to the Indians, that their patents extended they knew not where; many of them were of doubtful conſtruction, and very often covered each other in part, and have produced innumerable diſputes and miſchiefs in the colonies, ſome of which are not ſettled to this day. Connecticut conſtrued her charter literally, and paſſing over New York, which was then in poſſeſſion of the ſubjects of a Chriſtian prince, claimed, in latitude and breadth mentioned therein, to the South ſea. Accordingly purchaſes were made of the Indians, on the Delaware river, weſt of the weſtern bounds of New York, and within the ſuppoſed limits of Connecticut charter, and ſettlements were made thereon by people from, and under the juriſdiction of, Connecticut. The charter of Pennſylvania, granted to William Penn, in 1681, covered theſe ſettlements. This laid the foundation for a diſpute, which for a long time was maintained with warmth on both ſides. The matter was at laſt ſubmitted to gentlemen choſen for the purpoſe, who decided the diſpute in favour of Pennſylvania. Many, however, ſtill aſſert the juſtice of the Connecticut claim. The ſtate of Connecticut has lately ceded to Congreſs all their lands weſt of Pennſylvania, except a reſerve of 20 miles ſquare. This ceſſion Congreſs have accepted, and thereby indubitably eſtabliſhed the right of Connecticut to the reſerve.

The colony of New Haven, though unconnected with the colony of Connecticut, was comprehended within the limits of their charter, and, as they concluded, within their juriſdiction. But New Haven remonſtrated againſt their claim, and refuſed to unite with them until they ſhould hear from England. It was not until the year 1665, when it was believed that the king's commiſſioners had a deſign upon the New England charters, that theſe two colonies formed a union, which has ever ſince amicably ſubſiſted between them.

In 1672, the laws of the colony were reviſed, and the general court ordered them to be printed; and alſo, that "every family ſhould buy one of the law books; ſuch as pay in ſilver, to have a book for 12d. ſuch as pay in wheat, to pay a peck and a half a book: and ſuch as pay in peaſe, to pay 2s. a book, the peaſe at 3s. the buſhel." Perhaps it is owing to this early and univerſal ſpread of law books, that the people of Connecticut are to this day ſo fond of the law. In 1750, the laws of Connecticut were again reviſed and publiſhed in a ſmall folio volume of 258 pages. Dr Douglas obſerves, that they were the moſt natural, equitable, plain, and conciſe code of laws for plantations hitherto extant. There has been a reviſion of them ſince the peace, in which they were greatly and very judiciouſly ſimplified.

The years 1675 and 1676 were diſtinguiſhed by the wars with Philip and his Indians, and with the Narraganſetts, by which the colony was thrown into great diſtreſs and confuſion. The inroads of the enraged ſavages were marked with cruel murders, and with fire and devaſtation.

In 1684, the charters of Maſſachuſets Bay and Plymouth were taken away, in conſequence of Quo warrantos which had been iſſued againſt them. The charter of Connecticut would have ſhared the ſame fate had it not been for ——— Wadſworth, Eſq. who, having very artfully procured it when it was on the point of being delivered up, buried it under an oak tree in Hartford, where it remained until all danger was over, and then was dug up and reaſſumed.

Connecticut has ever made rapid advances in population. There have been more emigrations from this than from any of the other ſtates, and yet it is at preſent full of inhabitants. This increaſe, under the divine benediction, may be aſcribed to ſeveral cauſes. The bulk of the inhabitants are induſtrious, ſagacious huſbandmen. Their farms furniſh them with all the neceſſaries, moſt of the conveniences, and but few of the luxuries, of life. They of courſe are generally temperate, and, if they chooſe, can ſubſiſt with as much independence as is conſiſtent with happineſs. The ſubſiſtence of the farmer is ſubſtantial, and does not depend on incidental circumſtances, like that of moſt other profeſſions. There is no neceſſity of ſerving an apprenticeſhip to the buſineſs, nor of a large ſtock of money to commence it to advantage. Farmers, who deal much in barter, have leſs need of money than any other claſs of people. The eaſe with which a comfortable ſubſiſtence is obtained, induces the huſbandman to marry young. The cultivation of his farm makes him ſtrong and healthful. He toils cheerfully through the day—eats the fruit of his own labour with a gladſome heart—at night devoutly thanks his bounteous God for his daily bleſſings—retires to reſt, and his ſleep is ſweet. Such circumſtances as theſe have greatly contributed to the amazing increaſe of inhabitants in this ſtate.

Beſides, the people live under a free government, and have no fear of a tyrant. There are no overgrown eſtates, with rich and ambitious landlords, to have an undue and pernicious influence in the election of civil officers. Property is equally enough divided, and muſt continue to be ſo as long as eſtates deſcend as they now do. No perſon is prohibited from voting, or from being elected into office, on account of his poverty. He who has the moſt merit, not he who has the moſt money, is generally choſen into public office. As inſtances of this, it is to be obſerved, that many of the citizens of Connecticut, from the humble walks of life, have ariſen to the firſt offices in the ſtate, and filled them with dignity and reputation. That baſe buſineſs of electioneering, which is ſo directly calculated to introduce wicked and deſigning men into office, is yet but little known in Connecticut. A man who wiſhes to be choſen into office, acts wiſely for that end, when he keeps his deſires to himſelf.

A thirſt for learning prevails among all ranks of people in the ſtate. More of the young men in Connecticut, in proportion to their numbers, receive a public education, than in any of the ſtates. Dr Franklin and other literary characters have honoured this ſtate by ſaying, that it is the *Athens of America*.

The revolution, which ſo eſſentially affected the governments of moſt of the colonies, produced no very perceptible alteration in the government of Connecticut. While under the juriſdiction of Great Britain, they elected their own governors, and all ſubordinate civil officers, and made their own laws in the ſame manner and with as little controul as they now do. Connecticut has ever been a republic, and perhaps as perfect and as happy a republic as has ever exiſted. While other ſtates, more monarchial in their government and manners, have been under a neceſſity of undertaking the difficult taſk of altering their old, or forming new conſtitutions, and of changing their monarchical for republican manners, Connecticut has uninterruptedly proceeded in her old track, both as to government and manners; and by theſe means has avoided thoſe convulſions which have rent other ſtates into violent parties.

CONNECTION, or Connexion, the relation or dependence of one thing upon another.

Connection, or *Continuity*, in the drama, conſiſts in the joining of the ſeveral ſcenes together.

The connection is ſaid to be obſerved, when the ſcenes of an act ſucceed one another immediately, and are ſo joined as that the ſtage is never left empty.

CONNECTIVES, in *Grammar*, one of the four ſpecies under which, according to Mr Harris, all words may be included. They are of two kinds: and as they connect ſentences or words, are called by the different names of *conjunctions* and *prepoſitions*. See Grammar.

CONNIVENT valves, in *Anatomy*, thoſe wrinkles, cellules, and vaſcules, which are found in the inſides of the two inteſtines ilium and jejunum. See Anatomy, N° 93. *et ſeq.*

CONNOISSEUR, a French term, of late uſed in Engliſh: it literally denotes a perſon well verſed in any thing; being formed of the verb *connoitre*, "to know, underſtand." Hence it comes to be uſed in our language for a critic, or perſon who is a thorough judge or maſter in any way, particularly in matters of painting and ſculpture.

CONNOR, Bernard, a learned phyſician, was born in the county of Kerry, in Ireland, about the year 1666. Having determined to apply himſelf to the ſtudy of phyſic, he went to France, and reſided ſome time in the univerſity of Montpelier. Afterwards he went to Paris; where he obtained great ſkill in medicine, anatomy, and chemiſtry. From thence he travelled to Venice, with the two ſons of the high-chancellor of Poland; and then taking a tour through great part of Germany, went to Warſaw, where he was made phyſician to King John Sobieſki. In 1695, he came to England, read a courſe of lectures in London and Oxford, and became member of the Royal Society and College of Phyſicians; afterwards, being invited to Cambridge, he read public lectures there, and made various experiments in chemiſtry. He has rendered himſelf memorable for a philoſophical and medical treatiſe in Latin, entitled *Evangelium Medici*, i. e. "the Phyſician's Goſpel;" tending to explain the miracles performed by Chriſt as natural events, upon the principles of natural philoſophy. He wrote alſo a hiſtory of Poland; and died in 1698, aged 32.

Connor, a city of Ireland, in the county of Antrim, and province of Ulſter. W. Long. 6. 30. N. Lat. 54. 50.

CONOCARPUS, button-wood. See Botany *Index*.

CONOID, in *Geometry*, a ſolid body, generated by the revolution of a conic ſection about its axis. See *Conic Sections*.

CONOIDES, in *Anatomy*, a gland found in the third ventricle of the brain, called *pinealis*, from its reſemblance to a pine apple. See Anatomy *Index*.

CONON, the renowned Athenian general and admiral, flouriſhed 394 years before Chriſt. See Attica, N° 162, 163. After his defeat by Lyſander, he fled to Evagoras king of Cyprus; after which he put himſelf under the protection of Artaxerxes king of Perſia; with whoſe army he delivered Athens from the oppreſſion of ſtrangers, and rebuilt its walls. In the 360th year of Rome, he beat the Lacedemonians in a ſea-fight near Cnidus upon the coaſt of Aſia, deprived them of the ſovereign rule they had on ſea ever ſince the taking of Athens, and had ſome other conſiderable advantage over them: but falling into the hands of Teribazus a Perſian, who envied his glory, he was put to death.

CONOPS, in *Zoology*; a genus of inſects belonging to the order diptera. See Entomology *Index*.

CONOVIUM, in *Ancient Geography*, a town of the Ordovices, in Britain. From its ruins aroſe, at the diſtance of four miles, *Aberconwey*, the mouth of the Conwey, in Caernarvonſhire; and on the ſpot where *Conovium* ſtood is an hamlet, called *Caerhean*, the old town (Camden).

CONQUEST, in civil juriſprudence, is the acquiſition of property in common by a number of perſons.

In ſome countries they confound acquiſition with conqueſt; but, according to the moſt general acceptation, acquiſition is the gaining of unappropriated goods before the eſtabliſhment of a community: whereas by the term *conqueſt*, is ordinarily intended whatever is acquired by a number of perſons in community; or by ſome one for all the others. As it is more eſpecially in the union of perſons by marriage that a community of property takes place; ſo it is in reference to them that we frequently uſe the word *conqueſt*. There are nevertheleſs conqueſts alſo among other perſons who are in a tacit community or ſociety; ſuch as obtain by particular local cuſtoms. According to this ſenſe of the word, it has been contended by ſeveral, that William I. claimed this kingdom; that is, not by right of arms, but by right of conqueſt or acqueſt; under promiſe of ſucceſſion made by Edward the Confeſſor, and a contract entered into by Harold to ſupport his pretenſions to that ſucceſſion; and by old writers, *conqueſtus*, *acquiſitio*, and *perquiſitio*, are frequently uſed as ſynonymous terms.

Conquest, in the law of nations, is the acquiſition of ſovereignty by force of arms, by ſome foreign prince; who reduces the vanquiſhed under his empire. The right of conqueſt is derived from the laws of war; and when a people is ſubjected, the conduct of the conqueror is regulated by four kinds of law. Firſt, the law of nature, which dictates whatever tends to ſelf-preſervation; ſecondly, our reaſon, which teaches us to uſe others as we would be treated ourſelves; thirdly, the laws of political ſociety, to which nature has not aſſigned any preciſe boundary; laſtly, the law which is derived from the particular circumſtances attending the conqueſt. Thus, a ſtate conquered by another will be treated in one of the four methods following: Either the conqueror will continue it under its own laws, and will only claim the exerciſe of civil and eccleſiaſtical ſovereignty; or he will impoſe a new form of government; or he will deſtroy the frame of their ſociety, and incorporate the inhabitants with others; or he will exterminate them.

CONRAD II. elected emperor of Germany in 1004. He was obliged to take the field againſt moſt of the German dukes who had revolted from him; and he put Erneſt duke of Suabia under the ban of the empire. This being one of the earlieſt inſtances of ſuch a proſcription, the formula is inſerted here for its ſingularity. "We declare thy wife a widow, thy children orphans; and we ſend thee, in the name of the devil, to the four corners of the world." It was in the reign of this prince that the German fiefs became hereditary. He died in 1039.

Conrad III. emperor of Germany in 1338. The duke of Bavaria oppoſed his election, and being put under the ban of the empire, and deprived of his duchy, he could not ſurvive his diſgrace. The margrave of Auſtria was ordered by the emperor to take poſſeſſion of Bavaria; but Welſt, uncle to the deceaſed duke attacked him, and was defeated near the caſtle of Winſburgh; the battle fought upon this occaſion is famous in hiſtory, as having given riſe to the party names of *Guelphs* and *Gibbelines*, afterwards aſſumed in Italy. The parole of the day with the Bavarians was *Welſti*, from the name of their general; that of the Imperialiſts *Werblingen* from a ſmall village where Frederic duke of Suabia, their commander, had been nurſed: by degrees theſe names ſerved to diſtinguiſh the two parties; and the Italians, who could not accuſtom themſelves to ſuch rough words, formed from them their Gueiphs and Gibbelines. He died in 1152.

Conrad of Lichtenau, or Abbas Uſpergenſis, was author of an Univerſal Chronology from the creation to 1229, continued by an anonymous writer to Cha. V. He collected a fine library, and died about the year 1240.

CONRADIN, or Conrad junior, ſon of Conrad IV. was acknowledged emperor by the Gibbelines, who received him in triumph at Rome: but Pope Alexander IV. had publiſhed a cruſade againſt this orphan; and Urban VII. his ſucceſſor, gave the empire to Charles of Anjou, brother to Louis IX. king of France; and the unfortunate youth, though powerfully ſupported even by the Turks, loſt a battle, in which he was taken priſoner, and was beheaded, by order of his baſe opponent, publicly at Naples in 1229, in the 18th year of his age. In him ended the race of the dukes of Suabia, which had produced ſeveral kings and emperors.

CONSANGUINITY, or Kindred, is defined by the writers on theſe ſubjects to be, *vinculum perſonarum ab eodem ſtipite deſcendentium;* "the connexion or relation of perſons deſcended from the ſame ſtock or common anceſtor." This conſanguinity is either lineal or collateral.

Lineal conſanguinity is that which ſubſiſts between perſons of whom one is deſcended in a direct line from the other; as between John Stiles (the *propoſitus* in the table of conſanguinity) and his father, grandfather, great grandfather, and ſo upwards in the direct aſcending line; or between John Stiles and his ſon, grandſon, great grandſon, and ſo downwards in the direct deſcending line. Every generation in this direct lineal conſanguinity, conſtitutes a different degree, reckoning either upwards or downwards: the father of John Stiles is related to him in the firſt degree, and ſo likewiſe is his ſon; his grandſire and grandſon, in the ſecond; his great grandſire and great-grandſon in the third. This is the only natural way of reckoning the degrees in the direct line; and therefore univerſally obtains, as well in the civil and canon, as in the common law.

The doctrine of lineal conſanguinity is ſufficiently plain and obvious; but it is, at the firſt view, aſtoniſhing to conſider the number of lineal anceſtors which every man has, within no very great number of degrees: and ſo many different bloods is a man ſaid to contain in his veins, as he hath lineal anceſtors. Of theſe he hath two in the firſt aſcending degree; his own parents: he hath four in the ſecond; the parents of his father, and the parents of his mother: he hath eight in the third, the parents of his two grandfathers, and of his two grandmothers; and by the ſame rule of progreſſion, he hath 128 in the ſeventh; 1024 in the tenth; and at the 20th degree, or the diſtance of 20 generations, every man hath above a million of anceſtors, as common arithmetic will demonſtrate (A). This lineal conſanguinity, we may obſerve, falls ſtrictly within the definition of *vinculum perſonarum ab eodem ſtipite deſcendentium;* ſince lineal relations are ſuch as deſcend one from the other, and both of courſe from the ſame common anceſtorr.

Collateral kindred anſwers to the ſame deſcription:

(A) This will ſeem ſurpriſing to thoſe who are unacquainted with the increaſing power of progreſſive numbers; but is palpably evident from the following table of a geometrical progreſſion, in which the firſt term is 2, and the denominator alſo 2; or, to ſpeak more intelligibly, it is evident, for that each of us has two an-collateral relations agreeing with the lineal in this, that they deſcend from the ſame ſtock or anceſtor; but differing in this, that they do not deſcend the one from the other. Collateral kinſmen, then, are ſuch as lineally ſpring from one and the ſame anceſtor, who is the *ſtirps*, or "root," the *ſtipes*, "trunk," or common ſtock, from whence theſe relations are branched out. As if John Stiles hath two ſons, who have each a numerous iſſue; both theſe iſſues are lineally deſcended from John Stiles as their common anceſtor; and they are collateral kinſmen to each other, becauſe they are all deſcended from this common anceſtor, and all have a portion of his blood in their veins, which denominates them *conſanguineous*.

We muſt be careful to remember, that the very being of collateral conſanguinity conſiſts in this deſcent from one and the ſame common anceſtor. Thus Titius and his brother are related; why? becauſe both are derived from one father: Titius and his firſt couſin are related; why? becauſe both deſcend from the ſame grandfather; and his ſecond couſin's claim to conſanguinity is this, that they are both derived from one and the ſame great-grandfather. In ſhort, as many anceſtors as a man has, ſo many common ſtocks he has from which collateral kinſmen may be derived. And as we are taught by holy writ, that there is one couple of common anceſtors belonging to us all, from whom the whole race of mankind is deſcended, the obvious and undeniable conſequence is, that all men are in ſome degree related to one another. For, indeed, if we only ſuppoſe each couple of our anceſtors to have left, one with another, two children; and each of thoſe children to have left, on an average, two more (and without ſuch a ſuppoſition the human ſpecies muſt be daily diminiſhing); we ſhall find that all of us have now ſubſiſting near 270 millions of kindred in the 15th degree, at the ſame diſtance from the ſeveral common anceſtors as we ourſelves are; beſides thoſe that are one or two degrees nearer to our father from the common ſtock, who may amount to as many more (B). And if this calculation ſhould appear incompatible with the number of inhabitants on the earth, it is becauſe, by intermarriages among the ſeveral deſcendants from the ſame anceſtor, a hundred or a thouſand modes of conſanguinity may be conſolidated in one perſon; or he may be related to us a hundred or a thouſand different ways.

The method of computing theſe degrees in the canon law, which we have adopted, is as follows. We begin at the common anceſtor, and reckon downwards; and in whatſoever degree the two perſons, or the moſt remote of them, is diſtant from the common anceſtor, that is the degree in which they are related to each other. Thus, Titius and his brother are related in the firſt degree; for from the father to each of them is counted only one: Titius and his nephew are related in the ſecond degree; for the nephew is two degrees removed from the common anceſtor, viz. his own grandfather, the father of Titius: or (to give a more illuſtrious inſtance from the Engliſh annals)

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ceſtors in the firſt degree, the number of whom is doubled at every remove; becauſe each of our anceſtors has alſo two immediate anceſtors of his own.

1	2
2	4
3	8
4	16
5	32
6	64
7	128
8	256
9	512
10	1024
11	2048
12	4096
13	8192
14	16384
15	32768
16	65536
17	131072
18	262144
19	524288
20	1048576

A ſhorter way of finding the number of anceſtors at any given degree, is by ſquaring the number of anceſtors at half that number of degrees. Thus 16, the number of anceſtors at 4 degrees, is the ſquare of 4, the number of anceſtors at 2; 256 is the ſquare of 16; 65536 of 256; and the number of anceſtors at 40 degrees would be the ſquare of 1,048,576, or upwards of a million of millions.

(B) This will ſwell more conſiderably than the former calculation: for here, though the firſt term is but 1, the denominator is 4; that is, there is *one* kinſman (a brother) in the firſt degree, who makes, together with the *propoſitus*, the two deſcendants from the firſt couple of anceſtors; and in every other degree, the number of kindred muſt be the *quadruple* of thoſe in the degree which immediately precedes it. For ſince each couple of

King Henry VII. who ſlew Richard III. in the battle of Boſworth, was related to that prince in the fifth degree. Let the *propoſitus*, therefore, in the table of conſanguinity, repreſent King Richard III. and the claſs marked E, King Henry VII. Now their common ſtock or anceſtor was King Edward III. the *abavus* in the ſame table: from him to Edmund duke of York, the *proavus*, is one degree; to Richard earl of Cambridge, the *avus*, two; to Richard duke of York, the *pater*, three; to King Richard III. the *propoſitus*, four; and from King Edward III. to John of Gaunt (A) is one degree; to John earl of Somerſet (B) two; to John duke of Somerſet (C) three; to Margaret counteſs of Richmond (D) four; to King Henry VII. (E) five. Which laſt-mentioned prince, being the fartheſt removed from the common ſtock, gives the denomination to the degree of kindred in the canon and municipal law. Though according to the computation of the civilians (who count upwards from either of the perſons related, to the common ſtock, and then downwards again to the other; reckoning a degree for each perſon both aſcending and deſcending) theſe two princes were related in the ninth degree: for from King Richard III. to Richard duke of York is one degree; to Richard earl of Cambridge two; to Edmund duke of York three; to King Edward III. the common anceſtor, four; to John of Gaunt five; to John earl of Somerſet ſix; to John duke of Somerſet ſeven; to Margaret counteſs of Richmond eight; to King Henry VII. nine. See the Table of Conſanguinity (Plate CLXIV.), wherein all the degrees of collateral kindred to the *propoſitus* are computed, as far as the tenth of the civilians and the ſeventh of the canoniſts incluſive; the former being diſtinguiſhed by the numeral letters, the latter by the common ciphers.

CONSANGUINITY and *Affinity*, degrees of, forbidden in marriage. See MARRIAGE and LAW *Index*.

CONSANGUINITY and *Affinity*, an objection againſt a judge or a witneſs. See LAW *Index*.

CONSCIENCE, a ſecret teſtimony of the ſoul, whereby it gives its approbation to things that are naturally good, and condemns thoſe that are evil. See MORAL PHILOSOPHY.

A man of integrity will never liſten to any reaſon, or give way to any meaſure, or be miſled by any inducement, againſt conſcience.—The inhabitants of a great town offered Marſhal de Turenne 100,000 crowns, upon condition he would take another road, and not march his troops their way. He anſwered them, "As your town is not in the road I intend to march, I cannot accept the money you offer me."—The earl of Derby, in the reign of Edward III. making a deſcent

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anceſtors has two deſcendants who increaſe in a duplicate ratio, it will follow, that the ratio in which all the deſcendants increaſe downwards, muſt be double to that in which the anceſtors increaſe upwards: but we have ſeen, that the anceſtors increaſe in a duplicate ratio: therefore the deſcendants muſt increaſe in a double duplicate; that is, in a quadruple ratio.

Collateral Degrees.	*Number of Kindred.*
1	1
2	4
3	16
4	64
5	256
6	1024
7	4096
8	16384
9	65536
10	262144
11	1048576
12	4194304
13	16777216
14	67108864
15	268435456
16	1073741824
17	4294967296
18	17179869184
19	68719476736
20	274877906944

This calculation may alſo be formed by a more compendious proceſs, viz. by ſquaring the couples, or half the number of anceſtors, at any given degree; which will furniſh us with the number of kindred we have in the ſame degree, at equal diſtance with ourſelves from the common ſtock, beſides thoſe at unequal diſtances. Thus in the tenth lineal degree, the number of anceſtors is 1024; its half, or the couples, amount to 512; the number of kindred in the tenth collateral degree amounts therefore to 262144, or the ſquare of 512. And if we will be at the trouble to recollect the ſtate of the ſeveral families within our own knowledge, and obſerve how far they agree with this account; that is, whether, on an average, every man has not one brother or ſiſter, four firſt-couſins, ſixteen ſecond couſins, and ſo on, we ſhall find, that the preſent calculation is very far from being overcharged.

ſcent in Guienne, carried by ſtorm the town of Bergerac, and gave it up to be plundered. A Welch knight happened by chance to light upon the receiver's office. He found there ſuch a quantity of money that he thought himſelf obliged to acquaint his general with it, imagining that ſo great a booty naturally belonged to him. But he was agreeably ſurpriſed when the earl told him, with a pleaſant countenance, that he wiſhed him joy of his good fortune; and that he did not make the keeping of his word to depend upon the great or little value of the thing he had promiſed.—In the ſiege of Faliſci by Camillus general of the Romans, the ſchoolmaſter of the town, who had the children of the ſenators under his care, led them abroad under the pretext of recreation, and carried them to the Roman camp, ſaying to Camillus, that by this artifice he had delivered Faliſci into his hands. Camillus, abhorring this treachery, obſerved, "That there were laws for war as well as for peace; and that the Romans were taught to make war with integrity not leſs than with courage." He ordered the ſchoolmaſter to be ſtripped, his hands to be bound behind his back, and to be delivered to the boys to be laſhed back into the town. The Falerians, formerly obſtinate in reſiſtance, ſtruck with an act of juſtice ſo illuſtrious, delivered themſelves up to the Romans; convinced that they would be far better to have the Romans for their allies than their enemies.

It is a ſaying, That no man ever offended his own conſcience, but firſt or laſt it was revenged upon him. The power of conſcience indeed has been remarked in all ages, and the examples of it upon record are innumerable. The following is related by Mr Fordyce, in his *Dialogues on Education* *, as a real occurrence which happened in a neighbouring ſtate not many years ago. A jeweller, a man of good character and conſiderable wealth, having occaſion in the way of his buſineſs to travel at ſome diſtance from the place of his abode, took along with him a ſervant, in order to take care of his portmanteau. He had with him ſome of his beſt jewels, and a large ſum of money, to which his ſervant was likewiſe privy. The maſter having occaſion to diſmount on the road, the ſervant watching his opportunity, took a piſtol from his maſter's ſaddle and ſhot him dead on the ſpot; then rifled him of his jewels and money, and hanging a large ſtone to his neck, he threw him into the neareſt canal. With this booty he made off to a diſtant part of the country, where he had reaſon to believe that neither he nor his maſter were known. There he began to trade in a very low way at firſt, that his obſcurity might ſcreen him from obſervation, and in the courſe of a good many years ſeemed to riſe, by the natural progreſs of buſineſs, into wealth and conſideration; ſo that his good fortune appeared at once the effect and reward of induſtry and virtue. Of theſe he counterfeited the appearance ſo well, that he grew into great credit, married into a good family, and by laying out his hidden ſtores diſcreetly, as he ſaw occaſion, and joining to all an univerſal affability, he was admitted to a ſhare of the government of the town, and roſe from one poſt to another, till at length he was choſen chief magiſtrate. In this office he maintained a fair character, and continued to fill it with no ſmall applauſe, both as a governor and a judge; till one day as he ſat on the bench with ſome of his brethren, a criminal was brought before him who was accuſed of murdering his maſter. The evidence came out full, the jury brought in their verdict that the priſoner was guilty, and the whole aſſembly waited the ſentence of the preſident of the court (which he happened to be that day) with great ſuſpenſe. Meanwhile he appeared to be in unuſual diſorder and agitation of mind, and his colour changed often; at length he aroſe from his ſeat, and coming down from the bench, placed himſelf juſt by the unfortunate man at the bar. "You ſee before you (ſaid he, addreſſing himſelf to thoſe who had ſat on the bench with him), a ſtriking inſtance of the juſt rewards of heaven, which this day, after 30 years concealment, preſents to you a greater criminal than the man juſt now found guilty." Then he made an ample confeſſion of his guilt, and of all its aggravations. "Nor can I feel (continued he) any relief from the agonies of an awakened conſcience, but by requiring that juſtice be forthwith done againſt me in the moſt public and ſolemn manner." We may eaſily ſuppoſe the amazement of all the aſſembly, and eſpecially of his fellow-judges. However, they proceeded, upon this confeſſion, to paſs ſentence upon him, and he died with all the ſymptoms of a penitent mind.

Courts of CONSCIENCE, are courts for recovery of ſmall debts, conſtituted by act of parliament in London, Weſtminſter, &c. and other populous and trading diſtricts.

CONSCIOUSNESS. Metaphyſicians, in lieu of the word *conſcience*, which ſeems appropriated to theological or moral matters, ordinarily uſe that of *conſciouſneſs*; whereby they mean an inner ſentiment of a thing, whereof one may have a clear and diſtinct notion. In this ſenſe they ſay that we do not know our own ſoul, nor are aſſured of the exiſtence of our own thoughts, otherwiſe than by ſelf-conſciouſneſs. See METAPHYSICS.

CONSCRIPT, in Roman antiquity, an appellation given to the ſenators of Rome, who were called *conſcript fathers*, on account of their names being all entered in one regiſter.

CONSECRATION, the act of devoting any thing to the ſervice and worſhip of God. The Moſaical law ordained, that all the firſt-born, both of man and beaſt, ſhould be ſanctified or conſecrated to God. We find alſo that Joſhua conſecrated the Gibeonites, as Solomon and David did the Nethinims, to the ſervice of the temple; and that the Hebrews ſometimes conſecrated their fields and cattle to the Lord, after which they were no longer in their power.

Among the ancient Chriſtians, the conſecration of churches was performed with a great deal of pious ſolemnity. In what manner it was done for the three firſt ages, is uncertain; the authentic accounts reaching no higher than the fourth, when, in the peaceable reign of Conſtantine, churches were everywhere built, and dedicated with great ſolemnity. Some think the conſecration conſiſted in ſetting up the ſign of the croſs, or in placing a communion table in the church; and others, that no more was done than preaching a panegyrical ſermon in commemoration of the founder, and that then they proceeded to prayers, one of which was compoſed on purpoſe for the church to be conſecrated.

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* Vol. ii. p. 401.

crated. The Romaniſts have a great deal of pious foppery in the ceremonies of conſecration; which they beſtow on almoſt every thing, as bells, candles, books, water, oil, aſhes, palms, ſwords, banners, pictures, croſſes, agnus dei's, roſes, children's clouts, &c.

In England, churches have been always conſecrated with particular ceremonies, the form of which was left to the diſcretion of the biſhop. That obſerved by Biſhop Laud, in conſecrating St Catharine Creed church, in London, gave great offence.

CONSECRATION is particularly uſed for the benediction of the elements in the euchariſt.

CONSECRATION, among medaliſts, is the ceremony of the apotheoſis of an emperor, or his tranſlation into heaven and reception among the gods. On medals the conſecration is thus repreſented: on one ſide is the emperor's head, crowned with laurel, ſometimes veiled; and the inſcription gives him the title of *divus*: on the reverſe is a temple, a buſtum, an altar, or an eagle taking its flight towards heaven, either from off the altar, or from a cippus: at other times the emperor is ſeen in the air, borne up by the eagle; the inſcription always, *conſecratio*. Theſe are the uſual ſymbols: yet on the reverſe of that of Antoninus is the Antonine column. In the apotheoſis of empreſſes, inſtead of an eagle there is a peacock. As to the honours rendered theſe princes after death, they were explained by the words *conſecratio*, *pater*, *divus*, and *deus*. Sometimes around the temple or altar are put, *memoria felix*, or *memoriæ æternæ*: for princeſſes, *æternitas*, and *ſideribus recepta*: on the one ſide of the head, *dea*, or Θεα.

CONSENT, in a general ſenſe, denotes much the ſame with ASSENT.

CONSENT of Parts, in the animal economy, an agreement or ſympathy, whereby when one part is immediately affected, another at a diſtance becomes affected in the ſame manner.

This mutual accord or conſent is ſuppoſed to be effected by the commerce of the nerves, and their artful diſtribution and ramification throughout the body. The effect is ſo ſenſible as even to come under the phyſician's cognizance: thus, the ſtone in the bladder, by vellicating the fibres there, will pain and draw them ſo much into ſpaſms, as to affect the coats of the bowels, in the ſame manner, by the intermediation of nervous threads, and make a colic there; and alſo extend their twitches ſometimes as far as the ſtomach, and occaſion grievous vomitings; the remedy, therefore, in ſuch caſes, is to regard the part originally affected, how remote and grievous ſoever may be the conſequences and ſymptoms in other places.

The fifth conjugation of nerves branched to the parts of the eye, the ear, thoſe of the mouth, cheeks, præcordia, and parts adjacent, &c. is ſuppoſed by naturaliſts to be the inſtrument of that particular and extraordinary conſent between thoſe parts. Hence it is, that a ſavoury thing ſeen or ſmelled excites the appetite, and affects the glands and parts of the mouth; that a ſhameful thing ſeen or heard affects the cheeks with bluſhes: on the contrary, if it pleaſes, it affects the præcordia, and excites the muſcles of the mouth and face to laughter; if it grieve, it affects the glands of the eyes, ſo as to occaſion tears, and the muſcles of the face, putting them into an aſpect of crying. Dr Willis, quoted by Mr Derham, imputes the pleaſure of kiſſing, and its effects, to this pair of nerves; which being branched both to the lips and the genital parts, when the former are affected an irritation is occaſioned in the latter. See SYMPATHY.

CONSENTES, the name which the Romans gave to the 12 ſuperior gods, the *Dii majorum gentium*. The word ſignifies as much as *conſentientes*; that is, who conſented to the deliberations of Jupiter's council. They were twelve in number, whoſe names Ennius has briefly expreſſed in theſe lines,

Juno, Veſta, Minerva, Ceres, Diana, Venus, Mars,
Mercurius, Jovi, Neptunus, Vulcanus, Apollo.

CONSEQUENCE, in *Logic*, the concluſion or what reſults from reaſon or argument. See CONCLUSION.

The conſequence is that other propoſition in which the extremes or premiſes of a ſyllogiſm are joined, or ſeparated; and is gained from what was aſſerted in the premiſes.

This word, in a more reſtrained ſenſe, is uſed for the relation or connection between two propoſitions, whereof one is inferred from the other.

CONSEQUENT, ſomething deduced or gathered from a former argumentation. But, in a more preciſe ſenſe, it is uſed for the propoſition which contains the concluſion, conſidered in itſelf, without any regard to the antecedent: in which ſenſe the conſequent may be true, though the conſequence be falſe. See the preceding article.

CONSERVATOR, an officer ordained for the ſecurity and preſervation of the privileges of ſome cities and communities, having a commiſſion to judge of and determine the differences among them.

In moſt catholic univerſities there are two conſervators; the conſervator of royal privileges, or thoſe granted by kings; and the conſervator of apoſtolical privileges, or thoſe granted by the pope. The firſt takes cognizance of perſonal and mixed cauſes between the regents, ſtudents, &c. and the latter of ſpiritual matters between eccleſiaſtics.

Anciently there were appointed conſervators of treaties of peace between princes; which conſervators became judges of the infractions made on a treaty, and were charged with procuring ſatisfaction to be made. Theſe were uſually the feudatories of the ſeveral powers. In lieu of conſervators, princes now have recourſe to other indifferent princes to guarantee their treaties.

CONSERVATOR of Scots Privileges at Campvere, is an officer, belonging to the royal boroughs of Scotland, who takes care of the mercantile affairs of Scotland, agreeable to the ſtaple contract between them and the States-General.

CONSERVATOR of the Peace, in the ancient Engliſh cuſtoms, was a perſon who had an eſpecial charge, by virtue of his office, to ſee the king's peace kept. Till the erection of juſtices of the peace by King Edward III. there were ſeveral perſons who by common law were intereſted in keeping the ſame: ſome having that charge as incident to other offices; and others ſimply, or of itſelf, called *cuſtodes*, or *conſervators of the peace*. The chamberlain of Cheſter is ſtill a conſervator.

ſervator in that county; and petty conſtables are, by the common law, conſervators, &c. in the firſt ſenſe, within their own juriſdiction: ſo are alſo the coroner and the ſheriff within their own county. The king is the principal conſervator of the peace within all his dominions: the lord chancellor, lord treaſurer, lord high ſteward, lord marſhal, lord high conſtable, all the juſtices of the court of king's bench, by their office, and the maſter of the rolls, by preſcription, are general conſervators of the peace through the whole kingdom, and may commit breakers of the peace, and bind them in recogniſances to keep it.

Conservator *of the Truce, and Safe Conducts*, was an officer appointed in every ſea port, under the king's letters patent. His charge was to inquire of all offences committed againſt the king's truce, and ſafe conducts upon the main ſea, out of the franchiſes of the cinque-ports, as the admirals were wont to do, and ſuch other things as are declared anno 3 Hen. V. cap. 6.

CONSERVATORIOS, are muſical ſchools eſtabliſhed for the inſtruction of children in the profeſſion of muſic. There are four of theſe at Venice, deſigned for the education of girls, and three at Naples, for the education of boys. It has been ſuggeſted that the operation of caſtration was performed in the conſervatorios; but the practice is abſolutely prohibited: and the young caſtrati are brought from Lucia in Puglia: but before that operation is performed, their voices are tried in a conſervatorio. The ſcholars of the Venetian conſervatorios have been chiefly celebrated for taſte and neatneſs of execution; and thoſe of Naples have had the reputation of being the firſt *contrapuntiſts*, or compoſers, in Europe.

CONSERVATORY, a term ſometimes uſed for a green-houſe or ice-houſe.

CONSERVE, in *Pharmacy*, a form of medicine contrived to preſerve the flowers, herbs, roots, or fruits of ſeveral ſimples, as near as poſſible, to what they are when freſh gathered. See Pharmacy.

CONSIGNMENT, in *Law*, the depoſiting any ſum of money, bills, papers, or commodities, in good hands; either by appointment of a court of juſtice, in order to be delivered to the perſons to whom they are adjudged; or voluntarily, in order to their being remitted to the perſons they belong to, or ſent to the places they are deſigned for.

Consignment *of Goods*, in *Commerce*, is the delivering or making them over to another; thus, goods are ſaid to be conſigned to a factor, when they are ſent to him to be ſold, &c.; or when a factor ſends back goods to his principal, they are ſaid to be conſigned to him.

CONSISTENCE, in *Phyſics*, that ſtate of a body wherein its component particles are ſo connected or entangled among themſelves, as not to ſeparate or recede from each other. It differs from continuity in this, that it implies a regard to motion or reſt, which continuity does not, it being ſufficient to denominate a thing continuous that its parts are contiguous to each other.

CONSISTENTES, in church-hiſtory, a kind of penitents who were allowed to aſſiſt at prayers, but who could not be admitted to receive the ſacrament.

CONSISTORY (*Conſiſtorium*), ſignifies as much as *prætorium*, a tribunal: it is commonly uſed for a council-houſe of eccleſiaſtical perſons, or place of juſtice in the ſpiritual court; a ſeſſion or aſſembly of prelates. And every archbiſhop and biſhop of every dioceſe hath a conſiſtory court held before his chancellor or commiſſary in his cathedral church, or other convenient place of his dioceſe, for eccleſiaſtical cauſes. The biſhop's chancellor is the judge of this court, ſuppoſed to be ſkilled in the civil and canon law; and in places of the dioceſe far remote from the biſhop's conſiſtory, the biſhop appoints a commiſſary to judge in all cauſes within a certain diſtrict, and a regiſter to enter his decrees, &c.

Consistory, at Rome, denotes the college of cardinals, or the pope's ſenate and council, before whom judiciary cauſes are pleaded. Du Cange derives the word from *conſiſtorium*; i. e. *locus ubi conſiſtitur*; uſed chiefly for a veſtibule, gallery, or anti-chamber, where the courtiers wait for admiſſion: and ſo called *à conſiſtente multitudine*.

The conſiſtory is the firſt court, or tribunal of Rome: it never meets but when the pope pleaſes to convoke it: the pope preſides in it in perſon, mounted on a magnificent throne, and habited in his *pontificalia*; on the right are the cardinal-biſhops and prieſts, and on the left the cardinal-deacons. The place where it is held, is a large hall in the apoſtolical palace, where princes and ambaſſadors of kings are received. The other prelates, prothonotaries, auditors of the rota, and other officers, are ſeated on the ſteps of the throne: the courtiers ſit on the ground; ambaſſadors on the right, and conſiſtorial and fiſcal advocates behind the cardinals.

Beſides the public conſiſtory, there is alſo a private one, held in a retired chamber, called the *chamber of papegay*; the pope's throne here being only raiſed two ſteps high. Nobody is here admitted but the cardinals, whoſe opinions are collected, and called *ſentences*. Here are firſt propoſed and paſſed all bulls for biſhopricks, abbeys, &c. Hence biſhopricks and abbeys are ſaid to be conſiſtorial benefices; in regard they muſt be propoſed in the conſiſtory, the annates be paid to the pope, and his bulls taken. Anciently they were elective; but by the concordat, which aboliſhes elections, they are appointed to be collated by the pope alone, on the nomination of the prince.

Consistory was alſo the name of a court under Conſtantine, where he ſat in perſon, and heard cauſes: the members of this court were called *comites*.

Consistory is alſo uſed among the reformed, for a council or aſſembly of miniſters and elders, to regulate their affairs, diſcipline, &c.

Consistory, or *Court Chriſtian*, in the Engliſh laws, is a council of eccleſiaſtical perſons, or the place of juſtice in an eccleſiaſtical or ſpiritual court. Every archbiſhop and biſhop has a conſiſtory-court, held before his chancellor or commiſſary, either in his cathedral, in ſome chapel, aiſle, or portico, belonging thereto; or in ſome other convenient place of his dioceſe, for eccleſiaſtical cauſes. The ſpiritual court was anciently, in the time of the Saxons, joined with the county or hundred court; and the original of the conſiſtory court, as divided from thoſe courts, is found in a law of the conqueror, quoted by Lord Coke. From this court there lies an appeal to the archbiſhop of each province reſpectively.

CONSOLATION, one of the places in rhetoric, wherein the orator endeavours to abate and moderate the grief or concern of another.

CONSOLE, in *Architecture*, an ornament cut upon the key of an arch, which has a projecture, and on occaſion ſerves to ſupport little corniches, figures, buſts, and vaſes.

CONSOLIDATION, in *Law*, the combining and uniting two benefices into one. The term is borrowed from the civil law; where it properly ſignifies an union of the poſſeſſion, or occupation, with the property. Thus, if a man have by legacy *uſum fructum fundi*, and afterwards buy the property, or fee-ſimple, of the heir; this is called a *conſolidation*.

Consolidation, in *Medicine*, the action of uniting broken bones, or the lips of wounds, by means of *conſolidating remedies*, as they are called; which cleanſing with a moderate heat and force, taking corruption out of the wounds, and preſerving the temperature of the parts, cauſe the nouriſhment to be fitly applied to the part affected.

Among the many inſtances of the conſolidating power of blood and raw fleſh, we have a very remarkable one in Bartholine's Medical Obſervations. A man being condemned to have his noſe cut off by the hand of the common executioner, the friends, who were to be preſent, provided a new loaf of warm bread, which was cut in the middle, and the noſe received in it as it fell from the face: the noſe was after this nicely placed on the face again; and being ſewed on, the whole in time conſolidated, and left no other marks of the ignominy than the ſcar round the whole noſe, and the traces of the ſtitches.

CONSONANCE, in *Muſic*. See Interval.

CONSONANT, a letter that cannot be ſounded without ſome ſingle or double vowel before or after it; as *b*, *c*, *d*, &c.

CONSORT, *Queen Consort*. See Queen.

CONSPIRACY, in *Law*, ſignifies an agreement between two or more, falſely to indict, or procure to be indicted, an innocent perſon, of felony.

CONSPIRATORS are, by ſtatute, defined to be ſuch as bind themſelves by oath, covenant, or other alliance, to aſſiſt one another falſely and maliciouſly to indict perſons, or falſely to maintain pleas.

Conſpirators in treaſon, are thoſe that plot againſt the king and the government.

CONSTABLE, according to ſome, is a Saxon word, compounded of *coning*, "king," and *ſtaple* which ſignifies the "ſtay or ſupport of the king." But as we borrowed the name as well as the office of *Conſtable* from the French, Sir William Blackſtone is rather inclined to deduce it, with Sir Henry Spelman and Dr Cowel, from that language; wherein it is plainly derived from the Latin *comes ſtabuli*, an officer well known in the empire; ſo called, becauſe, like the great conſtable of France, as well as the lord high conſtable of England, he was to regulate all matters of chivalry, tilts, tournaments, and feats of arms, which were performed on horſeback.—The

Lord High Constable of England is the ſeventh great officer of the crown; and he, with the earl marſhal of England, were formerly judges of the court of chivalry, called in King Henry IV's time *Curia Militaris*, and now the court of honour. It is the fountain of the martial law, and anciently was held in the king's hall. The power of the lord high conſtable was formerly ſo great, and of which ſo improper a uſe was made, that ſo early as the 13th of King Richard II. a ſtatute paſſed for regulating and abridging the ſame, together with the power of the earl marſhal of England; and by this ſtatute, no plea could be tried by them or their courts, that could be tried by the common law of the realm. The office of conſtable exiſted before the conqueſt. After the conqueſt, the office went with inheritance, and by the tenure of the manors of Harlefield, Newman, and Whitenhurſt, in Glouceſterſhire, by grand ſerjeanty in the family of the Bohuns earl of Hereford and Eſſex, and afterwards in the line of Stafford as heirs-general to them; but in 1521, this great office became forfeited to the king in the perſon of Edward Stafford duke of Buckingham, who was that year attainted for high treaſon; and in conſideration of its extenſive power, dignity, and large authority, both in time of war and peace, it has never been granted to any perſon, otherwiſe than *hac vice*, and that to attend at a coronation, or trial by combat. In France, the ſame office was alſo ſuppreſſed about a century after by an edict of Louis XIII.; though it has been exerciſed, in the command of the Marshals, by the firſt officer in the army.

Lord high conſtable of Scotland was an office of great antiquity and dignity. The firſt upon record is Hugo de Morvelle in the reign of David I. He had two grand prerogatives, viz. Firſt, the keeping of the king's ſword, which the king, at his promotion, when he ſwears fealty, delivers to him naked. Hence the badge of the conſtable is a naked ſword.—Second, The abſolute and unlimited command of the king's armies while in the field, in the abſence of the king; but this command does not extend to caſtles and garriſons. He was likewiſe judge of all crimes committed within two leagues of the king's houſe, which precinct was called the *Chalmer of Peace*: though his juriſdiction came at laſt to be exerciſed only as to crimes during the time of parliament, which ſome extended likewiſe to all general conventions. This office was conferred heritably upon the noble family of Errol, by King Robert Bruce; and with them it ſtill remains, being expreſsly reſerved by the treaty of union.

Inferior Constables. From the great office of high conſtable is derived that inferior order, ſince called the *conſtables of hundreds and franchiſes*; theſe were firſt ordained in the 13th year of Edward I. by the ſtatute of Wincheſter; which, for the conſervation of the peace, and view of armour, appointed that two conſtables ſhould be choſen in every hundred and franchiſe. Theſe are what we now call *conſtabularii capitales*, or *high conſtables*; becauſe continuance of time, and increaſe of people, &c. have occaſioned others of like nature, but inferior authority, in every town, called *petty conſtables*, or *ſub-conſtabularii*, firſt inſtituted about the reign of Edward III.

The former, or modern *high conſtables*, are appointed at the court-leets of the franchiſe or hundred over which they preſide; or, in default of that, by the juſtices at their quarter-ſeſſions; and are removeable by the ſame authority that appoints them. The *petty conſtables* have two offices united in them, the one ancient, and the other modern. Their ancient office is that of head-borough, tithing-man, or borſholder; which is as ancient as the time of King Alfred: their more modern office is that of conſtable merely; which was appointed ſo lately as the reign of Edward III. in order to aſſiſt the high-conſtable. And in general the ancient head-boroughs, tithing-men, and borſholders, were made uſe of to ſerve as petty conſtables; though not ſo generally, but that in many places they ſtill continue diſtinct officers from the conſtables. They are all choſen by the jury at the court-leet; or, if no court-leet be held, are appointed by two juſtices of the peace.

The general duty of all conſtables, both high and petty, as well as of the other officers, is to keep the king's peace in their ſeveral diſtricts; and to that purpoſe they are armed with very large powers of arreſting and impriſoning, of breaking open houſes, and the like: of the extent of which powers, conſidering what manner of men are for the moſt part upon theſe offices, it is perhaps very well that they are generally kept in ignorance. One of their principal duties ariſing from the ſtatute of Wincheſter, which appoints them, is to keep watch and ward in their reſpective juriſdictions. Ward, guard, or *cuſtodia*, is chiefly intended of the day-time, in order, to apprehend rioters, and robbers, on the highways; the manner of doing which is left to the diſcretion of the juſtices of the peace and the conſtable: the hundred being, however, liable for all the robberies committed therein by day-light, for having kept negligent guard. Watch is properly applicable to the night only (being called among the Saxons *wach't* or *wactu*); and it begins when ward ends, and ends when that begins: for, by the ſtatute of Wincheſter, in walled towns the gates ſhall be cloſed from ſun-ſetting to ſun-riſing: and watch ſhall be kept in every borough and town, eſpecially in the ſummer ſeaſon, to apprehend all rogues, vagabonds, and night-walkers, and make them give an account of themſelves. The conſtable may appoint watchmen at his diſcretion, regulated by the cuſtom of the place; and theſe, being his deputies, have, for the time being, the authority of their principal.

There are alſo conſtables denominated from particular places, as conſtable of the Tower, of Dover caſtle, of Windſor caſtle, of the caſtle of Caernarvon and many other of the caſtles of Wales; whoſe office is the ſame with that of the caſtellani, or governors of caſtles.

Conſtables of London. The city of London is divided into 26 wards, and the wards into precincts, in each of which is a conſtable. They are nominated by the inhabitants of each precinct on St Thomas's day, and confirmed, or otherwiſe, at the court of wardmote. After confirmation, they are ſworn into their offices at a court of alderman, on the next Monday after Twelfth day. Such as are choſen into the office, are obliged to place the king's arms, and the arms of the city, over their doors; and if they reſide in alleys, at the ends of ſuch alleys toward the ſtreets, to ſignify that a conſtable lives there, and that they may be the more eaſily found when wanted.

Conſtables to Juſtices of the Peace, in Scotland, are the proper officers for executing their orders. They have powers to ſuppreſs tumults, and to apprehend delinquents and thoſe who can give no good account of themſelves, and carry them to the next juſtice.

CONSTANCE, a ſtrong town of Germany, in the circle of Suabia, with a biſhop's ſee, whoſe biſhop is a prince of the empire. It has a handſome bridge, and ſeveral fine ſtructures, as well ſacred as profane. It carries on a great trade, and is well fortified: and though it pretends to be an imperial town, the Auſtrians keep a garriſon here. It is famous for a council held here in 1514, when there were three popes; but they were all depoſed, and Martin V. was elected in their room. This council cauſed Jerom of Prague and John Huſs to be burnt, though the emperor Sigiſmund had given them a ſafe conduct; in purſuance of this maxim, "that no faith is to be kept with heretics." They likewiſe condemned the doctrine of Wickliff, and ordered his bones to be burned 40 years after he was dead. However, the inhabitants now are Proteſtants. It is ſeated on a lake of the ſame name. E. Long. 9. 10. N. Lat. 47. 38.

CONSTANCE, one of the moſt conſiderable and beautiful lakes of Switzerland, which ſeparates it from Suabia, except that part where the city of Conſtance is ſeated on its ſide. It is divided into three parts; the upper or largeſt part is called Boden ſee, the middle Bodmer ſee, and the lower part Zeller ſee. The firſt is 37 miles long, and its greateſt breadth 15 miles. It is deeper in ſummer than in winter.

CONSTANCY, in a general ſenſe, denotes immutability, or invariableneſs.—In ethics, or when applied to the human mind, the term implies reſolution or ſteadineſs, particularly under ſufferings and the trials of adverſity.

It was the ſaying of a heathen philoſopher, That there cannot be imagined upon earth a ſpectacle more worthy the regard of the Creator intent on his works, than a brave man ſuperior to his ſufferings. Nothing indeed can be more noble or honourable than to have courage enough to execute the commands of reaſon and conſcience; to maintain the dignity of our nature, and the ſtation aſſigned us; and to be proof againſt poverty, pain, and death itſelf, ſo far as not to do any thing that is ſcandalous or ſinful to avoid them. To be thus, is to be great above title or fortune. This argues the ſoul of a heavenly extraction, and is worthy the offspring of the Deity.

Of this virtue the following example, related in Engliſh hiſtory, is here ſelected, as ſuperior perhaps, all circumſtances conſidered, to any other upon record.

Sir William Aſkew of Kelſay, in Lincolnſhire, had ſeveral daughters. His ſecond, named *Anne*, had received a genteel education; which, with an agreeable figure and good underſtanding, rendered her a very proper perſon to be at the head of a family. Her father, regardleſs of his daughter's inclination and happineſs, obliged her to marry a gentleman who had nothing to recommend him but his fortune, and who was a moſt bigotted Papiſt. No ſooner was he convinced of his wife's regard for the doctrines of the reformation from popery, than, by the inſtigation of his prieſts, he violently drove her from his houſe, though ſhe had born him two children, and her conduct was unexceptionable. Abandoned by her huſband, ſhe came up to London, in order to procure a divorce, and to make herſelf known to that part of the court who either profeſſed or were favourers of Proteſtantiſm; but as Henry VIII. with conſent of parliament, had juſt enacted the law of the ſix articles, commonly called the *bloody ſtatute*, ſhe was cruelly betrayed by her own huſband; and, upon his information, taken into cuſtody, and examined concerning her faith. The act above mentioned denounced death againſt all thoſe who ſhould deny the doctrine of *tranſubſtantiation*; or, that the bread and wine made uſe of in the ſacrament was not converted after conſecration into the *real* body and blood of Chriſt; or, maintain the neceſſity of receiving the ſacrament in both kinds; or affirm, that it was lawful for prieſts to marry; that the vows of celibacy might be broken; that private maſſes were of no avail; and that auricular confeſſion to a prieſt was not neceſſary to ſalvation. Upon theſe articles ſhe was examined by the inquiſitor, a prieſt, the lord-mayor of London, and the biſhop's chancellor; and to all their queries gave proper and pertinent anſwers; but not being ſuch as they approved, ſhe was ſent back to priſon, where ſhe remained eleven days to ruminate alone on her alarming ſituation, and was denied the ſmall conſolation of a friendly viſit. The king's council being at Greenwich, ſhe was once more examined by Chancellor Wriotheſley, Gardiner biſhop of Wincheſter, Dr Cox, and Dr Robinſon; but not being able to convince her of ſuppoſed errors, ſhe was ſent to the Tower. Mr Strype, from an authentic paper, gives us the following ſhort account of her examination, which may not, perhaps, be unentertaining or uſeleſs to the reader: "Sir Martin Bowes (lord mayor) ſitting with the council, as moſt meet for his wiſdom, and ſeeing her ſtand upon life and death, I pray you, quoth he, my lords, give me leave to talk to this woman? Leave was granted. *Lord Mayor*. Thou fooliſh woman, ſayeſt thou that the prieſt cannot make the holy body of Chriſt? *A. Aſkew*. I ſay ſo, my lord: for I have read that God made man; but that man made God I never read; nor I ſuppoſe ever ſhall read it. *Lord Mayor*. No! Thou fooliſh woman, after the words of conſecration, is it not the Lord's body? *A. Aſkew*. No: it is but conſecrated bread, or ſacramental bread. *Lord Mayor*. What if a mouſe eat it after conſecration; what ſhall become of this mouſe? what ſayeſt thou, thou fooliſh woman? *A. Aſkew*. What ſhall become of her, ſay you, my lord? *Lord Mayor*. I ſay, that the mouſe is damned. *A. Aſkew*. Alack, poor mouſe!" Perceiving that ſome could not keep in their laughing, the council proceeded to the butchery and ſlaughter that they intended before they came there.—It was ſtrongly ſuſpected that Mrs Aſkew was favoured by ſome ladies of high rank; and that ſhe carried on a religious correſpondence with the queen. So that the chancellor Wriotheſley, hoping that he might diſcover ſomething that would afford matter of impeachment againſt that princeſs, the earl of Hertford, or his counteſs, who all favoured reformation, ordered her to be put to the rack: but her fortitude in ſuffering, and her reſolution not to betray her friends, was proof againſt that diabolical invention. Not a groan, not a word, could be extorted from her. The chancellor, provoked with what he called her obſtinacy, augmented her tortures with his own hands, and with unheard-of violence: but her courage and conſtancy were invincible; and theſe barbarians gained nothing by their cruelties but everlaſting diſgrace and infamy. As ſoon as ſhe was taken from the rack, ſhe fainted away; but being recovered, ſhe was condemned to the flames. Her bones were diſlocated in ſuch a manner, that they were forced to carry her in a chair to the place of execution. While ſhe was at the ſtake, letters were brought her from the lord chancellor, offering her the king's pardon if ſhe would recant. But ſhe refuſed to look at them; telling the meſſenger, that "ſhe came not thither to deny her Lord and Maſter." The ſame letters were alſo tendered to three other perſons condemned to the ſame fate; and who, animated by her example, refuſed to accept them. Whereupon the lord-mayor commanded the fire to be kindled; and with ſavage ignorance cried out, *Fiat juſtitia*, "Let juſtice take its courſe." The faggots being lighted, ſhe commended her ſoul, with the utmoſt compoſure, into the hands of her Maker; and, like the great founder of the religion ſhe profeſſed, expired, *praying for her murderers*, July 16. 1546, about the 25th year for her age.

CONSTANTIA, a diſtrict at the Cape of Good Hope, conſiſting of two farms, which produce the well-known wine ſo much prized in Europe, and known by the name of *Cape* or *Conſtantia* wine. This place is ſituated at the diſtance of a mile and a half from Alphen, in a bending formed by and nearly under the ridge of hills, which comes from Meuiſenmountain, and juſt where it ſtrikes off towards Houtbay. One of theſe farms is called *Little Conſtantia*. Here the white Conſtantia wine is made. The other produces the red. According to M. de la Cail's account, not more than 60 ſiggars of red and 90 of the white Conſtantia wine are made, each ſiggar being reckoned at 600 French pints, or about 150 Swediſh cans; ſo that the whole produce amounts to 22,500 cans. As the company are uſed to keep one-third of this for themſelves, the remainder is always beſpoke by the Europeans long before it is made. At the Cape this wine is ſeldom ſeen at table, partly becauſe it is dear, and partly becauſe it is the produce of the country. The red Conſtantia wine ſells for about 60 rixdollars the half awin; but the white is uſually to be purchaſed at a more reaſonable rate. The genuine Conſtantia wine is undeniably a very racy and delicate deſſert wine, and has ſomething peculiarly agreeable in the flavour of it. That its ſuperiority, however, is not owing to any thing peculiar in the manner of preparing it, ſeems extremely probable; for then, without doubt, a great deal more of it would be made. In fact, Dr Sparmann informs us, that the genuine wine can only be produced from particular ſoils. The diſtricts that lie next to theſe yield merely the common Cape wine, notwithſtanding that they have been planted with vine ſtocks taken from this, as well as with ſome brought from the banks of the Rhine, whence it is ſuppoſed that the true Conſtantia ſort originally comes; nay, even though all the vineyards about Conſtantia ſeem to have the ſame ſoil. We have inſtances at the Cape, as well as in Europe, that good grapes ſometimes produce a bad wine; while, on the other hand, bad grapes will yield a good ſort of wine: therefore, towards making wine of a certain quality, beſides finer materials, there muſt be certain conditions and circumſtances, which, by a diligent and rational inveſtigation, might probably be explored to the great benefit of mankind.

Such as are appriſed in what quantities Conſtantia wine is conſumed in Europe, will perhaps think the above calculation of the produce too limited. This, however, Dr Sparmann aſſures us, is by no means the caſe; the overplus being the produce of avarice, which, goaded on by the deſire of gain, will always hit upon ſome method of ſatisfying the demands of luxury and ſenſuality. The votaries of theſe, accuſtomed to be put off with empty ſounds, do not ſeldom drink with the higheſt reliſh an imaginary Conſtantia, with which, however, this liquor has nothing in common beſides the mere name. It is therefore adviſable, even at the Cape itſelf, to take care, that whilſt one has a genuine ſample given one to taſte, one is not made to pay for a made-up red Conſtantia, which otherwiſe is in general ſold for half the price. The rich quality of this wine, is, according to Barrow, owing partly to the ſituation and ſoil, and partly to the care in the manufacture; for ripe fruit only is uſed, and always entirely freed from the ſtalks.

CONSTANTINA, a ſtrong and conſiderable town of Africa, in the kingdom of Algiers, and capital of a territory of the ſame name. It is the largeſt and ſtrongeſt place in all the eaſtern parts; and it is ſeated on the top of a great rock. There is no way to it but by ſteps cut out of the rock; and the uſual way of puniſhing criminals here is to throw them down the cliff. Here are a great many Roman antiquities, particularly a triumphal arch. E. Long. 7. 12. N. Lat. 36. 4.

Constantina, a town of Spain, in Andaluſia, and capital of a ſmall territory of the ſame name, with a caſtle ſeated on a mountain. W. Long. 5. 35. N. Lat. 37. 40.

CONSTANTINE, a kingdom of Barbary of that name, in Africa. It is bounded on the north by the Mediterranean, on the eaſt by the kingdom of Tunis, on the ſouth by Bildulgerid, and on the weſt by the river Suſegmar, which ſeparates it from the kingdom of Bugia. The country is the New Numidia of the ancients, and had its own king; but it is now a province of Algiers.

Constantine the Great, the firſt emperor of the Romans who embraced Chriſtianity. His father, Conſtantius Chlorus, rendered hinſelf famous by his victorious expeditions to Germany and Britain: upon the abdication of Diocleſian, he ſhared the Roman empire with Galerius Maximinus in 305, and was at that time at York, where he died in 306; having firſt cauſed his ſon Conſtantine the Great to be proclaimed emperor by his army, and the Engliſh. Galerius at firſt refuſed to admit Conſtantine to his father's ſhare in the imperial throne; but after having loſt ſeveral battles, he conſented in 308. Maxentius, who ſucceeded Galerius, oppoſed him: but was defeated, and drowned himſelf in the Tyber. The ſenate then declared Conſtantine chief or firſt Auguſtus, and Licinius his ſecond aſſociate in the empire, in 412. Theſe princes publiſhed an edict, in their joint names, in favour of the Chriſtians; but ſoon after Licinius, jealous of Conſtantine's renown, conceived an implacable hatred againſt him, and renewed the perſecutions againſt the Chriſtians. This brought on a rupture between the emperors, and a battle, in which Conſtantine was victorious. A ſhort peace enſued: but Licinius having ſhamefully violated the treaty, the war was renewed; when Conſtantine totally defeating him, he fled to Nicomedia, where he was taken priſoner and ſtrangled in 323. Conſtantine, now become ſole maſter of the weſtern and eaſtern empires, immediately formed the plan of eſtabliſhing Chriſtianity as the religion of the ſtate; for which purpoſe, he convoked ſeveral eccleſiaſtical councils: but finding he was likely to meet with great oppoſition from the Pagan intereſt at Rome, he conceived the deſign of founding a new city, to be the capital of his Chriſtian empire; ſee Constantinople. The glory Conſtantine had acquired by eſtabliſhing the Chriſtian religion, was tarniſhed by the part he took in the perſecutions carried on by the Arians, towards the cloſe of his reign, againſt their Chriſtian brethren who differed from them: ſeduced by Euſebius of Nicomedia, he baniſhed ſeveral eminent prelates; ſoon after which, he died in 337, the 66th year of his age, and 31ſt of his reign.

As to the character of Conſtantine, he was chaſte, pious, laborious, and indefatigable; a great general, ſucceſsful in war, and deſerving his ſucceſs by his ſhining valour and by the brightneſs of his genius; a protector of arts, and an encourager of them by his beneficence. If we compare him with Auguſtus, we ſhall find that he ruined idolatry, by the ſame precautions and the ſame addreſs that the other uſed to deſtroy liberty. Like Auguſtus, he laid the foundation of a new empire; but poſſeſſed of leſs political ſkill, he could not give it the ſame ſtability: he weakened the body of the ſtate by adding to it, in ſome meaſure, a ſecond head in the foundation of Conſtantinople; and tranſporting the centre of motion and ſtrength too near the eaſtern extremity, he left without heat, and almoſt without life, the weſtern parts, which ſoon became a prey to the barbarians. The Pagans were too much his enemies to do him juſtice. Eutropius ſays, that in the former part of his reign he was equal to the moſt accompliſhed princes, and in the latter to the meaneſt. The younger Victor, who makes him to have reigned more than 31 years, pretends, that in the firſt 10 years he was a hero; in the 12 ſucceeding ones a robber; and in the 10 laſt a ſpendthrift. It is eaſy to perceive, with reſpect to theſe two reproaches of Victor's, that the one relates to the riches which Conſtantine took from idolatry, and the other to thoſe with which he loaded the church.

Constantine, emperor of the Eaſt in 1002, left the care of the empire to his wife Helena, who loaded the people with taxes, and ſold all the offices in church and ſtate to the higheſt bidders; while, the emperor employed himſelf in reading, writing, and the fine arts, till he became as good an architect and painter as he was a bad prince: he wrote ſeveral biographical and geographical works, which would have done honour to his name, if he had not neglected his duty to compoſe them. He died in 959.

Conſtantine, Conſtantinople.

CONSTANTINE *Dracoſes*, the ſon of Emmanuel Paleologus, was placed on the throne by Sultan Amurath in 1448. But Mahomet II. his ſucceſſor, reſolving to dethrone him, laid ſiege to Conſtantinople by ſea and land, and took it by aſſault in 1453, after it had held out 58 days. The unfortunate emperor ſeeing the Turks enter the breaches, threw himſelf into the midſt of the enemy, and was cut to pieces; the children of the imperial houſe were maſſacred by the ſoldiers; and the women reſerved to gratify the luſt of the conqueror; and thus terminated the dynaſty of the Conſtantines, 1123 years after its eſtabliſhment at Conſtantinople.

CONSTANTINE, *Robert*, a learned phyſician, born at Caen, taught polite literature in that city; and acquired great reputation by his ſkill in the Greek language, in hiſtory, and in medicine. He died in 1603 aged 103. He wrote a dictionary in Greek and Latin, and other works, which are eſteemed.

1 Removing the imperial ſeat to this city the cauſe of the decline of the weſtern empire.

CONSTANTINOPLE, the modern name of the city of BYZANTIUM in Thrace. It was enlarged and beautified by the Roman emperor Conſtantine the Great, in the year 330. At the ſame time he transferred thither the ſeat of the empire; and this removal is generally thought to have been one of the principal cauſes of the ſudden decline of the weſtern empire after this period.

2 Conſtantine defeats the Goths,

In the year 332, the Sarmatians implored Conſtantine's aſſiſtance againſt the Goths, who had made an irruption into their territories, and deſtroyed every thing with fire and ſword. The emperor readily granted their requeſt, and gained a complete victory. Near 100,000 of the enemy periſhed, either in the battle, or after it with hunger and cold. In conſequence of this overthrow, the Goths were obliged to ſue for peace; but the ungrateful Sarmatians no ſooner found themſelves delivered from their enemies, than they turned their arms againſt their benefactor, and ravaged the provinces of Mæſia and Thrace. The emperor, receiving intelligence of this treachery, returned with incredible expedition, cut great numbers of them in pieces, and obliged the reſt to ſubmit to what terms he was pleaſed to impoſe.

3 and the Sarmatians.

4 Is highly reſpected.

Conſtantine ſeems to have been a prince very highly reſpected, even by far diſtant nations. In 333, according to Euſebius, ambaſſadors arrived at Conſtantinople from the Blemyes, Indians, Ethiopians, and Perſians, courting his friendſhip. They were received in a moſt obliging manner; and learning from the ambaſſadors of Sapor king of Perſia, that there were great numbers of Chriſtians in their maſter's dominions, Conſtantine wrote a letter in their behalf to the Perſian monarch.

Next year, the Sarmatians being again attacked by the Goths, found themſelves obliged to ſet at liberty and arm their ſlaves againſt them. By this means they indeed overcame the Goths: but the victorious ſlaves turning their arms againſt their maſters, drove them out of the country. This misfortune obliged them, to the number of 300,000, to apply for relief to the Roman emperor, who incorporated with his legions ſuch as were capable of ſervice; and gave ſettlements to the reſt in Thrace, Scythia, Macedon, and Italy. This was the laſt remarkable action of Conſtantine the Great. He died on May 15. 337, having divided the empire among his children and nephews, in the following manner. Conſtantine his eldeſt ſon, had Gaul, Spain, and Britain: Conſtantius, the ſecond, had Aſia, Syria, and Egypt; and Conſtans, the youngeſt, Illyricum, Italy, and Africa. To his nephew Dalmatius, he gave Thrace, Macedon, and Achaia; and to King Annibalianus, his other nephew, Armenia Minor, Pontus, Cappadocia, and the city of Cæſarea, which he deſired might be the capital of his kingdom.

5 He takes a number of Sarmatians into his army.

Conſtantinopolitan hiſtory.

6 His death, and diviſion of the empire.

7 All his relations murdered except his three ſons and two nephews.

After the death of Conſtantine, the army and ſenate proclaimed his three ſons emperors, without taking any notice of his two nephews, who were ſoon after murdered, with Julius Conſtantius the late emperor's brother, and all their friends and adherents. Thus the family of Conſtantine was at once reduced to his three ſons, and two nephews Gallus and Julian, the ſons of Julius Conſtantius; and of theſe the former owed his life to a malady, from which no one thought he could recover; and the latter to his infancy, being then at moſt about ſeven years of age. The three brothers divided among themſelves the dominions of the deceaſed princes; but did not long agree together. In 340, Conſtantine having in vain ſolicited Conſtans to yield part of Italy to him, raiſed a conſiderable army; and under pretence of marching to the aſſiſtance of his brother Conſtantius, who was then at war with the Perſians, made himſelf maſter of ſeveral places in Italy. Hereupon Conſtans detached part of his army againſt him; and Conſtantine, being drawn into an ambuſcade near Aquileia, was cut off with his whole forces. His body was thrown into the river Anſa; but being afterwards diſcovered, was ſent to Conſtantinople, and interred there near the tomb of his father.

8 Conſtantine invades the dominions of Conſtans.

9 Is defeated, and killed.

10 Conſtans ſole maſter of the weſt.

11 Magnentius revolts againſt him.

By the defeat and death of his brother, Conſtans remained ſole maſter of all the weſtern part of the empire, in the quiet poſſeſſion of which he continued till the year 350. This year Magnentius, the ſon of one Magnus, a native of Germany, finding Conſtans deſpiſed by the army on account of his indolence and inactivity, reſolved to murder him, and ſet up for himſelf. Having found means to gain over the chief officers of the army to his deſigns, he ſeized on the imperial palace at Autun, and diſtributed among the populace what ſums be found there; which induced not only the city, but the neighbouring country, to eſpouſe his cauſe. But Conſtans being informed of what had paſſed, and finding himſelf unable to reſiſt the uſurper, fled towards Spain. He was overtaken, however, by Gaiſo, whom Magnentius had ſent after him with a choſen body of troops, and deſpatched with many wounds, at Helena, a ſmall village ſituated near the foot of the Pyrenees.

12 Conſtans murdered.

Thus Conſtantius acquired a right to the whole Roman empire; though one-half of it was ſeized by Magnentius after the murder of Conſtans. The former had been engaged in a war with the Perſians, in which little advantage was gained on either ſide; but the Perſians now giving no more diſturbance, the emperor marched againſt the uſurpers in the weſt. Beſides Magnentius, there were at that time two other pretenders to the weſtern empire. Veteranio, general of the foot in Pannonia, had, on the firſt news of the death of Conſtans, cauſed himſelf to be proclaimed emperor by the legions under his command. He was

13 Three pretenders to the empire.

a native of Upper Mæſia, and advanced in years when he uſurped the ſovereignty; but ſo illiterate, that he then firſt learned to read. The third pretender was Flavius Popilius Nepotianus, ſon of Eutropia, the ſiſter of Conſtantine the Great. Having aſſembled a company of gladiators and men of deſperate fortunes, he aſſumed the purple on the 3d of June 350, and in that attire preſented himſelf before the gates of Rome. The prefect Anicetus, who commanded there for Magnentius, ſallied out againſt him with a body of Romans, who were ſoon driven back into the city.

14
Nepotianus makes himſelf maſter of Rome.

Soon after Nepotianus made himſelf maſter of the city itſelf, which he filled with blood and ſlaughter. Magnentius being informed of what had happened, ſent againſt this new competitor his chief favourite and prime miniſter Marcellinus. Nepotianus received him with great reſolution; a bloody battle enſued between the ſoldiers of Magnentius and the Romans who had eſpouſed the cauſe of Nepotianus; but the latter being betrayed by a ſenator, named Heraclitus, his men were put to flight, and he himſelf killed, after having enjoyed the ſovereignty only 28 days.

15
He is defeated and killed.

Marcellinus ordered his head to be carried on the point of a lance through the principal ſtreets of the city; put to death all thoſe who had declared for him; and under pretence of preventing diſturbances, commanded a general maſſacre of all the relations of Conſtantine.

16
Tyranny of Magnentius.

Soon after, Magnentius himſelf came to Rome, to make the neceſſary preparations for reſiſting Conſtantius, who was exerting himſelf to the utmoſt in order to revenge the death of his brother. In the city he behaved moſt tyrannically, putting to death many perſons of diſtinction, in order to ſeize their eſtates; and obliged the reſt to contribute half of what they were worth towards the expence of the war. Having by this means raiſed great ſums, he aſſembled a mighty army compoſed of Romans, Germans, Gauls, Franks, Britons, Spaniards, &c.

17
Sends propoſals of peace to Conſtantius.

At the ſame time, however, dreading the uncertain iſſues of war, he diſpatched ambaſſadors to Conſtantius with propoſals of accommodation. Conſtantius ſet out from Antioch about the beginning of autumn; and, paſſing through Conſtantinople, arrived at Heraclea, where he was met by the deputies from Magnentius, and others from Veteranio, who had agreed to ſupport each other in caſe the emperor would hearken to no terms. The deputies of Magnentius propoſed in his name a match between him and Conſtantia, or rather Conſtantina, the ſiſter of Conſtantius, and widow of Annibalianus; offering, at the ſame time, to Conſtantius the ſiſter of Magnentius. At firſt the emperor would hearken to no terms; but afterwards, that he might not have to oppoſe two enemies at once, concluded a ſeparate treaty with Veteranio, by which he agreed to take him for his partner in the empire. But when Veteranio aſcended the tribunal along with Conſtantius, the ſoldiers pulled him down from thence, crying out, That they would acknowledge no other emperor than Conſtantius alone. On this Veteranio threw himſelf at the emperor's feet, and implored his mercy. Conſtantius received him with great kindneſs, and ſent him to Pruſia in Bithynia, where he allowed him a maintenance ſuitable to his quality.

18
Gallus ſent againſt the Perſians.

Conſtantius, now maſter of all Illyricum, and of the army commanded by Veteranio, reſolved to march againſt Magnentius without delay. In the mean time, however, on advice that the Perſians were preparing to invade the eaſtern provinces, he married his ſiſter Conſtantina to his couſin-german Gallus; created him Cæſar on the 15th of March; and allotted him for his ſhare not only all the Eaſt, but likewiſe Thrace and Conſtantinople. About the ſame time Magnentius gave the title of Cæſar to his brother Decentius, whom he diſpatched into Gaul to defend that country againſt the barbarians who had invaded it; for Conſtantius had not only ſtirred up the Franks and Saxons to break into that province, by promiſing to relinquiſh to them all the places they ſhould conquer, but had ſent them large ſupplies of men and arms for that purpoſe.

19
Conſtantius ſtirs up the Franks to invade Gaul.

On this encouragement the barbarians invaded Gaul with a mighty army, overthrew Decentius in a pitched battle, committed everywhere dreadful ravages, and reduced the country to a moſt deplorable ſituation. In the mean time Magnentius having aſſembled a numerous army, left Italy, and croſſing the Alps, advanced into the plains of Pannonia, where Conſtantius, whoſe main ſtrength conſiſted in cavalry, was waiting for him. Magnentius hearing that his competitor was encamped at a ſmall diſtance, invited him by a meſſenger to the extenſive plains of *Sciſcia* on the Save, there to decide which of them had the beſt title to the empire.

20
Is defeated by Magnentius.

This challenge was by Conſtantius received with great joy; but as his troops marched towards Sciſcia in diſorder, they fell into an ambuſcade, and were put to flight with great ſlaughter. With this ſucceſs, Magnentius was ſo elated, that he rejected all terms of peace, which were now offered by Conſtantius; but after ſome time, a general engagement enſued at Murſa, in which Magnentius was entirely defeated, with the loſs of 24,000 men.

21
Magnentius defeated at Murſa.

Conſtantius, though victor, is ſaid to have loſt 30,000, which ſeems improbable. All authors however, agree, that the battle at Murſa proved fatal to the weſtern empire, and greatly contributed to its ſpeedy decline.

22
This battle fatal to the empire.

After his defeat at Murſa, Magnentius retired into Italy, where he recruited his ſhattered forces as well as he could. But the beginning of the following year, 352, Conſtantius, having aſſembled his troops, ſurpriſed and took a ſtrong caſtle on the Julian Alps, belonging to Magnentius, without the loſs of a man. After this the emperor advanced in order to force the reſt; upon which Magnentius was ſtruck with ſuch terror, that he immediately abandoned Aquileia, and ordered the troops that guarded the other paſſes of the Alps to follow him. Thus Conſtantius entering Italy without oppoſition, made himſelf maſter of Aquileia. From thence he advanced to Pavia, where Magnentius gained a conſiderable advantage over him. Notwithſtanding this loſs, however, Conſtantius reduced the whole country bordering on the Po, and Magnentius's men deſerted to him in whole troops, delivering up to him the places they had garriſoned; by which the tyrant was ſo diſheartened, that he left Italy, and retired with all his forces into Gaul. Soon after this, Africa, Sicily, and Spain, declared for Conſtantius; upon which Magnentius ſent a ſenator, and after him ſome biſhops, to treat of a peace: but the emperor treated the ſenator as a ſpy, and ſent back the biſhops without any anſwer.—Magnentius now finding his affairs deſperate, and that there were no hopes of pardon, recruited his army in the beſt manner he could, and diſpatched an aſſaſſin into the eaſt to murder Gallus Cæſar; hoping that his death would oblige the emperor to withdraw his forces from Gaul, and march in perſon to the defence of the eaſtern provinces, which were threatened by the Perſians. The aſſaſſin gained over ſome of Gallus's guards; but the plot being diſcovered before it could be put in execution, they were all ſeized and executed as traitors.

23
Magnentius attempts to get Gallus murdered.

14
Magnentius defeated a ſecond time; kills all his family and himſelf.

In 353, the war againſt Magnentius was carried on with more vigour than ever, and at laſt happily ended by a battle fought in the Higher Dauphiny. Magnentius, being defeated, took ſhelter in Lyons; but the few ſoldiers who attended him, deſpairing of any further ſucceſs, reſolved to purchaſe the emperor's favour by delivering up to him his rival, the author of ſo calamitous a war. Accordingly they ſurrounded the houſe where he lodged; upon which the tyrant, in deſpair, ſlew with his own hand his mother, his brother Deſiderius whom he had created Cæſar, and ſuch of his friends and relations as were with him: and then fixing his ſword in a wall, threw himſelf upon it, in order to avoid a more ſhameful death which he had reaſon to apprehend.

After the death of Magnentius, his brother Decentius Cæſar, who was marching to his aſſiſtance, and had already reached Sens, finding himſelf ſurrounded on all ſides by the emperor's forces, choſe rather to ſtrangle himſelf than fall alive into the hands of his enemies. Thus Conſtantius was left ſole maſter of the Roman empire. His panegyriſts tell us, that after his victory he behaved with the greateſt humanity, forgiving and receiving into favour his greateſt enemies; but other hiſtorians differ conſiderably from them, and tell us that Conſtantius now became haughty, imperious, and cruel, of which many inſtances are given.

25
Conſtantius ſole maſter of the empire.

26
Many grievous calamities.

This year the empire was ſubjected to very grievous calamities. Gaul was ravaged by the barbarians beyond the Rhine, and the diſbanded troops of Magnentius. At Rome, the populace roſe on account of a ſcarcity of proviſions. In Aſia, the Iſaurian robbers overran Lycaonia and Pamphylia; and even laid ſiege to Seleucia, a city of great ſtrength; which, however, they were not able to make themſelves maſters of. At the ſame time the Saracens committed dreadful ravages in Meſopotamia, the Perſians alſo invaded the province of Anthemuſia on the Euphrates. But the eaſtern provinces were not ſo much haraſſed by the barbarians as by Gallus Cæſar himſelf, who ought to have protected them. That prince was naturally of a cruel, haughty, and tyrannical diſpoſition; but being elated with his ſucceſſes againſt the Perſians, he at laſt behaved more like a tyrant and a madman than a governor. His natural cruelty is ſaid to have been heightened by the inſtigations of his wife Conſtantina, who is by Ammianus ſtyled the *Megæra*, or "fury of her ſex:" and he adds, that her ambition was equal to her cruelty. Thus all the provinces and cities in the eaſt were filled with blood and ſlaughter. No man, however innocent, was ſure to live or enjoy his eſtate a whole day; for Gallus's temper being equally ſuſpicious and cruel, thoſe who had any private enemies took care to accuſe them of crimes againſt the ſtate, and with Gallus it was the ſame thing to be accuſed and condemned. At laſt the emperor being informed from all quarters of the evil conduct of his brother-in-law, and being at the ſame time told that he aſpired to the ſovereignty, reſolved upon his ruin. For this end he wrote letters to Gallus and Conſtantina, inviting them both into Italy. Though they had both ſufficient reaſon to fear the worſt, yet they durſt not venture to diſobey the emperor's expreſs command. Conſtantina, who was well acquainted with her brother's temper, and hoped to pacify him by her artful inſinuations, ſet out firſt, leaving Gallus at Antioch: but ſhe had ſcarce entered the province of Bithynia, when ſhe was ſeized with a fever which put an end to her life. Gallus now deſpairing of being able to appeaſe his ſovereign, thought of openly revolting; but moſt of his friends deſerted him on account of his inconſtant and cruel temper, ſo that he was at laſt obliged to ſubmit to the pleaſure of Conſtantius. He advanced, therefore, according to his orders; but at Petavium was arreſted, and ſtripped of all the enſigns of his dignity. From thence he was carried to Fianona, now *Fianone*, in Dalmatia, where he was examined by two of his moſt inveterate enemies. He confeſſed moſt of the crimes laid to his charge; but urged as an excuſe the evil counſels of his wife Conſtantina. The emperor, provoked at this plea which reflected on his ſiſter, and inſtigated by the enemies of Gallus, ſigned a warrant for his execution, which was performed accordingly.

27
Tyranny of Gallus.

28
He is put to death.

29
War with the Germans.

All this time the emperor had been engaged in a war with the Germans: he had marched againſt them in perſon: and though he gained an advantage, the barbarians thought proper to make peace with him. This, however, was but ſhort-lived. No ſooner was the Roman army withdrawn, than they began to make new inroads into the empire. Againſt them Conſtantius deſpatched Arbetio with the flower of the army; but he fell into an ambuſcade, and was put to flight with the loſs of a great number of men. This loſs, however, was ſoon retrieved by the valour of Arinthæus, who became famous in the reign of Valens, and of two other officers, who falling upon the Germans, without waiting the orders of their general, put them to flight, and obliged them to leave the Roman territories.

The tranquillity of the empire, which enſued on this repulſe of the Germans, was ſoon interrupted by a pretended conſpiracy, by which in the end a true one was produced. Sylvanus, a leading man among the Franks, commanded in Gaul, and had there performed great exploits againſt the barbarians. He had been raiſed to this poſt by Arbetio; but only with a deſign to remove him from the emperor's preſence, in order to accompliſh his ruin, which he did in the following manner: One *Dynames*, keeper of the emperor's mules, leaving Gaul, begged of Sylvanus letters of recommendation to his friends at court; which being granted, the traitor eraſed all but the ſubſcription. He then inſerted directions to the friends of Sylvanus for the carrying on a conſpiracy; and delivering theſe forged letters to the prefect Lampidius, they were by him ſhown to the emperor. Thus Sylvanus was forced to revolt, and cauſe himſelf to be proclaimed emperor by the troops under his command.

30
Sylvanus betrayed by Arbetio.

31
He is forced to revolt.

In the mean time, however, Dynames having thought proper to forge another letter, the fraud was diſcovered, and an inquiry ſet on foot, which brought to light the whole matter. Sylvanus was now declared innocent, and letters ſent to him by the emperor confirming him in his poſt; but theſe were ſcarce gone, when certain news arrived at the court of Sylvanus having revolted, and cauſed himſelf be proclaimed emperor. Conſtantius, thunderſtruck at this news, diſpatched againſt him Urſicinus, an officer of great integrity, as well as valour and experience in war; who forgetting his former character, pretended to be Sylvanus's friend, and thus found means to cut him off by treachery.

32 s murdered.

33 Gaul ravaged by the barbarians.

The barbarians, who had been hitherto kept quiet by the brave Sylvanus, no ſooner heard of his death, than they broke into Gaul with greater fury than ever. They took and pillaged above forty cities, and among the reſt Cologne, which they levelled with the ground. At the ſame time the Quadi and Sarmatians entering Pannonia, deſtroyed every thing with fire and ſword. The Perſians alſo, taking advantage of the abſence of Urſicinus, overran, without oppoſition, Armenia and Meſopotamia; Proſper and Mauſonianus, who had ſucceeded that brave commander in the government of the eaſt, being more intent upon pillaging than defending the provinces committed to their care.

34 Julian created Cæſar.

Conſtantius not thinking it adviſable to leave Italy himſelf, reſolved at laſt to raiſe his couſin Julian, the brother of Gallus, to the dignity of Cæſar. Julian ſeems to have been a man of very extraordinary talents; for though before this time he had been entirely buried in obſcurity, and converſed only with books, no ſooner was he put at the head of an army than he behaved with the ſame bravery, conduct, and experience, as if he had been all his life bred up to the art of war. He was appointed governor of Gaul; but before he ſet out, Conſtantius gave him in marriage his ſiſter Helena, and made him many valuable preſents. At the ſame time, however, the jealous emperor greatly limited his authority; gave him written inſtructions how to behave; ordered the generals who ſerved under him to watch all his actions no leſs than thoſe of the enemy; and ſtrictly enjoined Julian himſelf not to give any largeſſes to the ſoldiery.

Julian ſet out from Milan on the firſt of December 355, the emperor himſelf accompanying him as far as Pavia, from whence he purſued his journey to the Alps, attended only by 360 ſoldiers. On his arrival at Turin he was firſt acquainted with the loſs of Cologne, which had been kept concealed from the emperor. He arrived at Vienne before the end of the year, and was received by the people of that city and the neighbourhood with extraordinary joy.

35 He ſets out for Gaul.

In 356, the barbarians beſieged *Autun;* to relieve which place, Julian marched with what forces he could raiſe. When he came there, he found the ſiege raiſed: on which he went in purſuit of the barbarians to Auxerre, croſſing with no ſmall danger thick woods and foreſts, from Auxerre to *Troies*. On his march he was ſurrounded on all ſides by the barbarians, who moved about the country in great bodies; but he put them to flight with a handful of men, cut great numbers of them in pieces, and took ſome priſoners.

36 Defeats the barbarians.

From Troies he haſtened to Rheims, where the main body of the army, commanded by Marcellus, waited his arrival. Leaving Rheims, he took his route towards Decempagi, now *Dieuze*, on the Seille in Lorrain, with a deſign to oppoſe the Germans who were buſy in ravaging that province. But the enemy attacking his rear unexpectedly, would have cut off two legions, had not the reſt of the army, alarmed at the ſudden noiſe, turned back to their aſſiſtance. A few days afterwards he defeated the Germans, though with great loſs to his own army; the victory, however, opened him a way to Cologne. This city he found abandoned by the barbarians. They had neglected to fortify it: but Julian commanded the ancient fortifications to be repaired with all poſſible expedition, and the houſes to be rebuilt; after which he retired to Sens, and there took up his winter-quarters.

37 Repairs the fortifications of Cologne.

This year alſo Conſtantius entered Germany on the ſide of Rhætia, laid waſte the country far and wide; and obliged the barbarians to ſue for peace, which was readily granted. The ſame year he enacted two laws; by one of which it was declared capital to ſacrifice, or pay any kind of worſhip, to idols; the other, granting the effects of condemned perſons to belong to their children and relations within the third degree, except in caſes of magic and treaſon; but this laſt one he revoked two years after.

38 Idolatry declared capital by Conſtantius.

In the beginning of the year 357, the barbarians beſieged Julian a whole month in Sens; Marcellus, the commander in chief, never once offering to aſſiſt him. Julian, however, ſo valiantly defended himſelf with the few forces he had, that the barbarians at laſt retired. After this, Conſtantius declared Julian commander in chief of all the forces in Gaul; appointing under him one *Severus*, an officer of great experience, and of a quite different diſpoſition from Marcellus. On his arrival in Gaul, Julian received him with great joy, raiſed new troops, and ſupplied them with arms which he luckily found in an old arſenal. The emperor, reſolving at all events to put a ſtop to the terrible devaſtations committed by the barbarous nations, chiefly by the Alemans, wrote to Julian to march directly againſt them. At the ſame time he ſent Barbatio, who had been appointed general in place of Sylvanus, with a body of 25 or 30,000 men, out of Italy, in order to incloſe the enemy between two armies. The Leti, however, a German nation, paſſing between the armies, advanced as far as Lyons, hoping to ſurpriſe that wealthy city; but meeting with a warmer reception than they expected, contented themſelves with ravaging the country all round it. On the firſt notice of this expedition, Julian detached ſtrong parties to guard the paſſages through which he knew the barbarians muſt return. Thus they were all cut off except thoſe who marched near the camp of Barbatio;

39 The Leti cut off by Julian.

who was ſo far from cutting off their retreat, that he complained by a letter to Conſtantius of ſome officers for attempting it. Theſe officers, among whom was Valentinian afterwards emperor of the weſt, were, by the orders of Conſtantius, caſhiered for their diſobedience. The other barbarians either fortified themſelves in the countries which they had ſeized, ſtopping up all the avenues with huge trees, or took ſhelter in the iſlands formed by the Rhine. Julian reſolved firſt to attack the latter; and with this view demanded ſome boats of Barbatio: but he, inſtead of complying

Conſtantinopolitan hiſtory.

40
He forces the barbarians to abandon the iſlands of the Rhine.

41
Entirely defeats them at Straſburg.

complying with his juſt requeſt, immediately burnt all his boats, as he did on another occaſion the proviſions which had been ſent to both armies, after he had plentifully ſupplied his own. Julian, not in the leaſt diſheartened with his unaccountable conduct, perſuaded ſome of the moſt reſolute of his men to wade over to one of the iſlands. Here they killed all the Germans who had taken ſhelter in it. They then ſeized their boats, and purſued the ſlaughter in ſeveral other iſlands, till the enemy abandoned them all, and retired to their reſpective countries with their wives and what booty they could carry. On their departure, Barbatio attempted to lay a bridge of boats over the Rhine; but the enemy, appriſed of his intention, threw a great number of huge trees into the river, which being carried by the ſtream againſt the boats, ſunk ſeveral of them, and parted the reſt. The Roman general then thought proper to retire, but the barbarians falling unexpectedly upon him in his retreat, cut great numbers of his men in pieces, took moſt of his baggage, laid waſte the neighbouring country, and returned in triumph loaded with booty. Elated with this ſucceſs, they aſſembled in great numbers under the command of *Chnodomarius*, a prince of great renown among them, and ſix other kings. They encamped in the neighbourhood of Straſburg. Here they were encountered by Julian; who put them to flight, with the loſs of 6000 or 8000 of their men ſlain in the field, and a vaſtly greater number drowned in the river; while Julian himſelf loſt only 243 private men and four tribunes. In this action Chnodomarius was taken, and ſent to Rome, where he ſoon after died.

42
He enters Germany and concludes a truce with the barbarians.

43
Remarkable laws of Conſtantius.

After the battle, Julian advanced with all his army to Mayence, where he built a bridge over the Rhine and entered Germany, having with difficulty prevailed upon his army to follow him. Here he ravaged the country till the time of the autumnal equinox, when being prevented by ſnow from advancing any further, he began to repair the fort of Trajan, by ſome ſuppoſed to be the caſtle of Cromburgh, about three or four leagues from Frankfort. The barbarians were now ſo much alarmed, that they ſent deputies to treat of a peace; but this Julian refuſed to grant them upon any terms. He conſented, however, to a truce for ſeven months, upon their promiſing to ſtore with proviſions the fort he was building in their country. This year Conſtantius made ſome remarkable laws. By one he puniſhed with confiſcation ſuch as renounced the Chriſtian for the Jewiſh religion; and by another, addreſſed to Felix biſhop of Rome, he exempted all merchandiſing eccleſiaſtics, with their wives, children, and domeſtics, from every impoſition ordinary and extraordinary: ſuppoſing the gains they made to be applied by them to the relief of the poor.

44
Julian conquers the Franks.

45
Grants a peace to the Germans.

In 358, as ſoon as the ſeaſon was fit for action, Julian took the field againſt the Franks, with a deſign to conquer them before the truce he had concluded with the Alemans was expired. The Franks were at that time divided into ſeveral tribes, the moſt powerful of which were the Salii and Chamavi. The firſt of theſe ſent deputies, intreating that he would ſuffer them to remain as friends to the empire in the country they poſſeſſed. But Julian, without paying any regard to this deputation, entered their country, and obliged them to ſubmit; after which he allotted them lands in Gaul, incorporating great numbers of them into his cavalry. He next marched againſt the Chamavi, whom he defeated and obliged to retire beyond the Rhine. Afterwards he rebuilt three forts on the river Meuſe, which had been deſtroyed by the barbarians; but wanting proviſions in a country ſo often ravaged, he ordered 600 or 800 veſſels to be built in Britain for the conveying corn from thence into Gaul. Julian continued in the country of the Chamavi till the expiration of his truce with the Alemans; and then laying a bridge of boats over the Rhine, he entered their country, putting all to fire and ſword. At laſt two of their kings came in perſon to him to ſue for peace: which Julian granted, upon their promiſing to ſet at liberty the captives they had taken; to ſupply a certain quantity of corn when required; and to furniſh wood, iron, and carriages, for repairing the cities they had ruined. The priſoners whom he at this time releaſed, amounted to upwards of 20,000.

46
Expediti of Conſtatius again ſome Ge man nations.

47
He expe the Lim gantes.

Soon after the vernal equinox of this year, 358, Conſtantius marched in perſon againſt the Quadi and Sarmatians, whoſe country lay beyond the Danube. Having croſſed that river on a bridge of boats, he laid waſte the territories of the Sarmatians; who thereupon came in great numbers, together with the Quadi, pretending to ſue for peace. Their true deſign was to ſurpriſe the Romans; but the latter ſuſpecting it, fell upon them ſword in hand, and cut them all in pieces. This obliged the reſt to ſue for peace in good earneſt, which was granted on the delivery of hoſtages. The emperor then marched againſt the *Limigantes*, that is, the ſlaves who, in 334, had driven the Sarmatians out of their country, and ſeized it for themſelves*. They uſed the ſame artifice as the Sarmatians and Quadi had done, coming in great numbers under pretence of ſubmitting, but prepared to fall upon him unexpectedly if opportunity offered. The emperor, obſerving their ſurly looks, and diſtruſting them, cauſed his troops ſurround them inſenſibly while he was ſpeaking. The Limigantes then diſpleaſed with the conditions he offered them, laid their hands on their ſwords: on which they were attacked by the Roman ſoldiers. Finding it impoſſible to make their eſcape, they made with great fury towards the tribunal, but were repulſed by the guards forming themſelves into a wedge, and every one of them cut in pieces. After this, the emperor ravaged their country to ſuch a degree, that they were in the end obliged to ſubmit to the only condition he thought proper to allow them, which was to quit their country, and retire to a more diſtant place. The country was then reſtored to the Sarmatians, who were its original poſſeſſors.

*See Nº

48
Haughty embaſſy from Sa of Perſia.

This year is alſo remarkable for a very haughty embaſſy from Sapor king of Perſia. The ambaſſador, named *Narſes*, brought a letter, in which the Perſian monarch ſtyled himſelf "king of kings, brother of the ſun and moon," &c. He acquainted the emperor, that he might lawfully inſiſt on having all the countries beyond the river Strymon in Macedon delivered up to him; but leſt his demands ſhould ſeem unreaſonable, he would be contented with Armenia and Meſopotamia, which had been moſt unjuſtly taken from his grandfather Narſes. He added, that unleſs juſtice was done him, he was reſolved to aſſert his right by force of arms. This letter was preſented to Conſtantius wrapped up in a piece of white ſilk; but he, without entering into any negotiation with the ambaſſador, wrote a letter to Sapor, in which he told him, that as he had maintained the Roman dominions in their full extent, when he was poſſeſſed only of the eaſt, he could not ſuffer them to be curtailed now when he was maſter of the whole empire. In a few days, however, he ſent another letter, with rich preſents; being very deſirous at leaſt to put off the war till he had ſecured the northern provinces againſt the incurſions of the barbarians, that he might then employ all the forces of the empire againſt ſo formidable an enemy. This embaſſy proved unſucceſsful, as did alſo another which was ſent ſoon after. The laſt ambaſſadors were impriſoned as ſpies, but afterwards diſmiſſed unhurt.

49
A law againſt magicians, &c.

By a law of Conſtantius dated in 358, all magicians, augurs, aſtrologers, and pretenders to the art of divination, were declared enemies to mankind; and ſuch of them as were found in the court either of the emperor or of Julian, he commanded to be put to the torture, and ſpecified what torments they were to undergo.

In 359, Julian continued his endeavours for relieving the province of Gaul, which had ſuffered ſo much from the incurſions of the barbarians. He erected magazines in different places, viſited the cities which had ſuffered moſt, and gave orders for repairing their walls and fortifications properly. He then croſſed the Rhine, and purſued the war in Germany with great ſucceſs, inſomuch that the barbarians ſubmitted to ſuch terms as he pleaſed to impoſe.

50
Treachery of the Limigantes.

In the mean time, the emperor, having received intelligence that the Limigantes had quitted the country in which he had placed them, haſtened to the banks of the Danube, in order to prevent their entering Pannonia. On his arrival he ſent deputies, deſiring to know what had induced them to abandon the country which had been allotted them. The Limigantes anſwered, in appearance with the greateſt ſubmiſſion imaginable, that they were willing to live as true ſubjects of the empire in any other place; but that the country he had allotted them was quite uninhabitable, as they could demonſtrate if they were but allowed to croſs the river, and lay their complaints before him. This requeſt was granted; but while he aſcended his tribunal, the barbarians unexpectedly fell upon his guards ſword in hand, killed ſeveral of them, and the emperor with difficulty ſaved himſelf by flight.

51
They are all cut off.

The reſt of the troops, however, ſoon took the alarm, and ſurrounding the Limigantes, cut them all off to a man.

52
The heathens cruelly perſecuted.

This year Conſtantius inſtituted a court of inquiſition againſt all thoſe who conſulted heathen oracles. Paulus Catena, a noted and cruel informer, was diſpatched into the eaſt to proſecute them; and Modeſtus, then count of the eaſt, and equally remarkable for his cruelty, was appointed judge. His tribunal was erected at Scythopolis in Paleſtine, whither perſons of both ſexes, and of every rank and condition, were daily dragged in crowds from all parts, and either confined in dungeons, or torn in pieces in a moſt cruel and barbarous manner by racks, or publicly executed.

53
The Perſians begin hoſtilities.

In 359, Sapor king of Perſia began hoſtilities, being encouraged thereto by the abſence of Urſicinus, whom the emperor had recalled, and appointed in his room one Sabinianus, a perſon very unfit for ſuch an office. During this campaign, however, he made very little progreſs; having only taken two Roman forts, and deſtroyed the city of Amida, the ſiege of which is ſaid to have coſt him 30,000 men. On the firſt news of the Perſian invaſion, Conſtantius had thought proper to ſend Urſicinus into the eaſt; but his enemies prevented him from receiving the ſupplies neceſſary for carrying on the war; ſo that he found it impoſſible to take any effectual means for ſtopping the progreſs of the Perſians. On his return, he was unexpectedly charged with the loſs of Amida, and all the diſaſters that had happened during the campaign. Two judges were appointed to inquire into his conduct; but they, being creatures of his enemies, left the matter doubtful. On this Urſicinus was ſo much exaſperated, that he appealed to the emperor, and in the heat of paſſion let fall ſome unguarded expreſſions, which being immediately carried to the emperor, the general was deprived of all his employments.

54
Conſtantius marches in perſon againſt them.

Conſtantius reſolved to march next year in perſon againſt the Perſians; but in the mean time, dreading to encounter ſo formidable an enemy, he applied himſelf wholly to the aſſembling of a mighty army, by which he might be able fully to cope with them. For this purpoſe he wrote to Julian to ſend him part of his forces, without conſidering that by ſo doing he left the province of Gaul expoſed to the ravages of the barbarians. Julian reſolved immediately to comply with the emperor's orders; but at the ſame time to abdicate the dignity of Cæſar, that he might not be blamed for the loſs of the province. Accordingly he ſuffered the beſt ſoldiers to be draughted out of his army.

54
Julian proclaimed emperor.

They were, however, very unwilling to leave him, and at laſt proclaimed him emperor. Whether this was done abſolutely againſt Julian's conſent or not is uncertain; but he wrote to the emperor, and perſuaded the whole army alſo to ſend a letter along with his, in which they acquainted Conſtantius with what had happened, and entreated him to acknowledge Julian as his partner in the empire. But this was poſitively refuſed by Conſtantius, who began to prepare for war. Julian then, deſigning to be before-hand with the emperor, cauſed his troops take an oath of allegiance to himſelf, and with ſurpriſing expedition made himſelf maſter of the whole country of Illyricum, and the important paſs ſeparating that country from Thrace. Conſtantius was thunderſtruck with this news; but hearing that the Perſians had retired, he marched with all his force againſt his competitor. On his arrival at Tarſus in Cilicia, he was ſeized with a feveriſh diſtemper, occaſioned chiefly by the uneaſineſs and perplexity of his mind.

56
Conſtantius marches againſt him, but dies.

He purſued his march, however, to Moſucrene, a place on the borders of Cilicia, at the foot of Mount Taurus. Here he was obliged to ſtop by the violence of his diſorder, which increaſed every day, and at laſt carried him off on the 13th of November 361, in the 45th year of his age.

57
Julian reſtores the heathen religion.

By the death of Conſtantius, Julian now became maſter of the whole Roman empire without a rival. He had been educated in the Chriſtian religion; but ſecretly apoſtatized from it long before, and as ſoon as he ſaw himſelf maſter of Illyricum, openly avowed his apoſtaſy, and cauſed the temples of the gods to be opened. When the meſſengers arrived at Naiſſus in Illyricum, where he then was, to acquaint him with his being ſole maſter of the empire, they found him conſulting the entrails of victims concerning the event of his journey. As the omens were uncertain, he was at that time very much embarraſſed and perplexed; but the arrival of the meſſengers put an end to all his fears, and he immediately ſet out for Conſtantinople. At Heraclea he was met by almoſt all the inhabitants of this metropolis, into which he made his public entry on the 11th of December 361, being attended by the whole ſenate in a body, by all the magiſtrates, and by the nobility magnificently dreſſed, every one teſtifying the utmoſt joy at ſeeing ſuch a promiſing young prince raiſed to the empire without bloodſhed. He was again declared emperor by the ſenate of Conſtantinople; and as ſoon as that ceremony was over, he cauſed the obſequies of Conſtantius to be performed with great pomp.

58 Condemns ſome of the late emperor's miniſters.

The firſt care of Julian was to inquire into the conduct of the late emperor's miniſters. Several of theſe having been found guilty of enormous crimes, were condemned and executed; particularly the noted informer Paulus Catena, and another named *Apodamus*, were ſentenced to be burnt alive. Along with theſe, however, was put to death one Urſula, a man of unexceptionable character, and to whom Julian himſelf was highly indebted. He had been ſupplied with money by Urſula, unknown to the emperor, at the time when he was ſent into Gaul with the title of Cæſar, but without the money neceſſary for the ſupport of that dignity. For what reaſon he was now put to death, hiſtorians do not acquaint us. Julian himſelf tells us, that he was executed without his knowledge.

59 Reforms the court.

The emperor next ſet about reforming the court. As the vaſt number of offices was in his time become an intolerable burden, he diſcharged all thoſe whom he thought uſeleſs. He reduced, among the reſt, the officers called *agentes in rebus*, from 10,000 to 17; and diſcharged thouſands of cooks, barbers, &c. who by their large ſalaries drained the exchequer. The *curioſi*, whoſe office it was to inform the emperor of what had paſſed in the different provinces, were all diſcharged, and that employment entirely ſuppreſſed. Thus he was enabled to eaſe the people of the heavy taxes with which they were loaded: and this he did by abating a fifth part of all taxes and impoſts throughout the kingdom.

60 Recals the philoſophers, magicians, &c.

As to religious matters, Julian, as before obſerved, was a Pagan, and immediately on his acceſſion to the throne reſtored the heathen religion. He invited to court the philoſophers, magicians, &c. from all parts; nevertheleſs, he did not raiſe any perſecution againſt the Chriſtians. On the contrary, he recalled from baniſhment all the orthodox biſhops who had been ſent into exile during the former reign; but with a deſign, as is obſerved both by the Chriſtian and Pagan writers, to raiſe diſturbances and ſow diſſenſions in the church.

61 Marches againſt the Perſians.

As the Perſians were now preparing to carry on the war with vigour, Julian found himſelf under a neceſſity of marching againſt them in perſon. But before he ſet out, he enriched the city of Conſtantinople with many valuable gifts. He formed a large harbour to ſhelter the ſhips from the ſouth wind, built a magnificent porch leading to it, and in another porch a ſtately library, in which he lodged all his books. In the month of May, A. D. 362, he ſet out for Antioch; and on the firſt of January renewed in that city the ſacrifices to Jupiter for the ſafety of the empire, which had been ſo long omitted. During his ſtay in this city, he continued his preparations for the Perſian war, erecting magazines, making new levies, and above all conſulting the oracles, aruſpices, magicians, &c. The oracles of Delphi, Delos, and Dodona, aſſured him of victory. The aruſpices, indeed, and moſt of his courtiers and officers, did all that lay in their power to divert him from his intended expedition; but the deceitful anſwers of the oracles and magicians, and the deſire of adding the Perſian monarch to the many kings he had already ſeen humbled at his feet, prevailed over all other conſiderations. Many nations ſent deputies to him offering their aſſiſtance; but theſe offers he rejected, telling them that the Romans were to aſſiſt their allies, but ſtood in no need of any aſſiſtance from them. He likewiſe rejected, and in a very diſobliging manner, the offers of the Saracens; anſwering them, when they complained of his ſtopping the penſion paid them by other emperors, that a warlike prince had ſteel, but no gold; which they reſenting, joined the Perſians, and continued faithful to them to the laſt. However, he wrote to Arſaces king of Armenia, enjoining him to keep his troops in readineſs to execute the orders he ſhould ſoon tranſmit to him.

62 Croſſes th Euphrate

Having made the neceſſary preparations for ſo important an enterpriſe, Julian ſent orders to his troops to croſs the Euphrates, deſigning to enter the enemy's country before they had the leaſt notice of his march; for which purpoſe he had placed guards on all the roads. From Antioch he proceeded to Litarba, a place about 15 leagues diſtant, which he reached the ſame day. From thence he went to Beræa, where he halted a day, and exhorted the council to reſtore the worſhip of the gods; but this exhortation, it ſeems, was complied with but by few. From Beræa he proceeded to Batnæ; and was better pleaſed with the inhabitants of the latter, becauſe they had, before his arrival, reſtored the worſhip of the gods. There he offered ſacrifices; and having immolated a great number of victims, he purſued the next day his journey to Hierapolis, the capital of the province of Euphrateſiana, which he reached on the 9th of March. Here he lodged in the houſe of one for whom he had a particular eſteem, chiefly becauſe neither Conſtantius nor Gallus, who had both lodged in his houſe, had been able to make him renounce the worſhip of his idols. As he entered this city, 50 of his ſoldiers were killed by the fall of a porch. He left Hierapolis on the 13th of March; and having paſſed the Euphrates on a bridge of boats, came to Batnæ a ſmall city of Oſrhoene, about 10 leagues from Hierapolis; and here 50 more of his ſoldiers were killed by the fall of a ſtack of ſtraw. From Batnæ he proceeded to Carrhæ; where, in the famous temple of the moon, it is ſaid he ſacrificed a woman to that planet.

63 Invades Perſia.

While Julian continued in this city, he received advice that a party of the enemies horſe had broke into the Roman territories. On this he reſolved to leave an army in Meſopotamia, to guard the frontiers of the empire on that ſide, while he advanced on the other into the heart of the Perſian dominions. This army conſiſted, according to ſome, of 20,000, according to others, of 30,000 choſen troops. It was commanded by Procopius, and Sebaſtian a famous Manichean who had been governor of Egypt, and had perſecuted there, with the utmoſt cruelty, the orthodox Chriſtians. Theſe two were to join, if poſſible, Arſaces king of Armenia, to lay waſte the fruitful plains of Media, and meet the emperor in Aſſyria. To Arſaces Julian himſelf wrote, but in the moſt diſobliging manner imaginable, threatening to treat him as a rebel if he did not execute, with the utmoſt punctuality, the orders given him: and at the concluſion told him, that the God he adored would not be able to ſcreen him from his indignation.

There were two roads leading from Carrhæ to Perſia; the one to the left by Niſibis; the other to the right through the province of Aſſyria, along the banks of the Euphrates. Julian choſe the latter, but cauſed magazines to be erected on both roads; and, after having viewed his army, ſet out on the 25th of March. He paſſed the Abora, which ſeparated the Roman and Perſian dominions, near its conflux with the Euphrates; after which he broke down the bridge, that his troops might not be tempted to deſert, ſeeing they could not return home. As he proceeded on his march, a ſoldier and two horſes were ſtruck dead by a flaſh of lightning; and a lion of an extraordinary ſize preſenting himſelf to the army, was in a moment diſpatched by the ſoldiers with a ſhower of darts. Theſe omens occaſioned great diſputes between the philoſophers and aruſpices: the latter looking upon them as inauſpicious, adviſed the emperor to return; but the former refuted their arguments with others more agreeable to Julian's temper.

64
ys waſte Aſſyria.

Having paſſed the Abora, Julian entered Aſſyria, which he found very populous, and abounding with all the neceſſaries of life; but he laid it waſte far and near, deſtroying the magazines and proviſions which he could not carry along with him; and thus he put it out of his power to return the ſame way he came; a ſtep which was judged very impolitic. As he met with no army in the field to oppoſe him, he advanced to the walls of Cteſiphon, the metropolis of the Perſian empire; having reduced all the ſtrong holds that lay in his way. Here, having cauſed the canal to be cleared, which was formerly dug by Trajan between theſe two rivers, he conveyed his fleet from the former to the latter. On the banks of the Tigris he was oppoſed by the enemy. But Julian paſſed that river in ſpite of their utmoſt efforts and drove them into the city with the loſs of a great number of their men, he himſelf, in the mean time, loſing only 70 or 75.

65
Advances to Cteſiphon.

66
Begins his etreat, but diſtreſſed or want of roviſions.

Julian had now advanced ſo far into the enemy's country, that he found it neceſſary to think of a retreat, as it was impoſſible for him to winter in Perſia. For this reaſon he made no attempt on Cteſiphon, but began to march back along the banks of the Tigris, ſoon after he had paſſed that river. In the mean time the king of Perſia was aſſembling a formidable army, with a deſign to fall upon the Romans in their march; but being deſirous of putting an end to ſo deſtructive a war, he ſent very advantageous propoſals of peace to Julian. Theſe the Roman emperor very imprudently rejected; and ſoon after, deceived by treacherous guides, he quitted the river, and entered into an unknown country totally laid waſte by the enemy; and where he was continually haraſſed by ſtrong parties, who in a manner ſurrounded his army, and attacked him ſometimes in the front, and ſometimes in the rear. A ſtill worſe ſtep he was perſuaded to take by the treacherous guides already mentioned: and this was to burn his fleet, leſt it ſhould fall into the hands of the enemy. As ſoon as the fleet was ſet on fire, the whole army cried out, that the emperor was betrayed, and that the guides were traitors employed by the enemy. Julian ordered them immediately to be put to the rack, upon which they confeſſed the treaſon; but it was too late. The fleet was already in flames; they could by no means be extinguiſhed; and no part was ſaved except 12 veſſels, which were deſigned to be made uſe of in the building of bridges, and for this purpoſe were conveyed over land in waggons.

The emperor thus finding himſelf in a ſtrange country, and his army greatly diſpirited, called a council of his chief officers, in which it was reſolved to proceed to Corduene, which lay ſouth of Armenia, and belonged to the Romans. With this view they had not proceeded far, when they were met by the king of Perſia, at the head of a very numerous army, attended by his two ſons, and all the principal nobility of the kingdom. Several ſharp encounters happened, in which, though the Perſians were always defeated, yet the Romans reaped no advantages from their victories, but were reduced to the laſt extremity for want of proviſions. In one of theſe ſkirmiſhes, when the Romans were ſuddenly attacked, the emperor, eager to repulſe the enemy, haſtened to the field of battle without his armour, when he received a mortal wound by a dart, which, through his arm and ſide, pierced his very liver. Of this wound he died the ſame night, the 26th of June 363, in the 32d year of his age, after having reigned ſcarce 20 months from the time he became ſole maſter of the Roman empire.

67
Is mortally wounded in a ſudden attack by the Perſians.

68
Jovian raiſed to the empire.

As Julian had declined naming any ſucceſſor, the choice of a new emperor devolved on the army. They unanimouſly choſe Jovian, a very able commander, whoſe father had lately reſigned the poſt of *comes demeſticorum*, in order to lead a retired life. The valour and experience of Jovian, however, were not ſufficient to extricate the Roman army from the difficulties in which they had been plunged by the imprudence of his predeceſſor. The famine raged in the camp to ſuch a degree, that not a ſingle man would have been left alive, had not the Perſians unexpectedly ſent propoſals of peace. Theſe were now received with the utmoſt joy. A peace was concluded for 30 years; the terms of which were, that Jovian ſhould reſtore to the Perſians the fine provinces which had been taken from them in the reign of Diocleſian, with ſeveral caſtles, and the cities of Niſibis and Singara. After the concluſion of the treaty, Jovian purſued his march without moleſtation. When he arrived at Antioch, he revoked all the laws that had been made in the former reign againſt Chriſtianity and in favour of Paganiſm. He eſpouſed alſo the cauſe of the orthodox Chriſtians againſt the Arians; and he called all thoſe who had been formerly baniſhed, particularly Athana-

69
Concludes a peace with the Perſians.

ſius, to whom he wrote a very obliging letter, with his own hand. It is generally believed alſo that Athanaſius, at the deſire of Jovian, now compoſed the creed which ſtill goes by his name, and is ſubſcribed by all the biſhops in Europe. But this emperor did not live to make any great alterations, or even to viſit his capital as emperor; for in his way to Conſtantinople he was found dead in his bed, on the 16th or 17th of February 364, after he had lived 33 years, and reigned ſeven months and 40 days.

70
His death.

71
Valentinian choſen emperor, chooſes Valens for his partner.

After the death of Jovian, Valentinian was choſen emperor. Immediately on his acceſſion, the ſoldiers mutinied, and with great clamour required him to chooſe a partner in the ſovereignty. Though he did not inſtantly comply with their demand, yet in a few days he choſe his brother Valens for his partner; and, as the empire was threatened on all ſides with an invaſion of the barbarous nations, he thought proper to divide it. This famous partition was made at Mediana in Dacia. Valens had for his ſhare the whole of Aſia, Egypt, and Thrace; and Valentinian all the Weſt; that is, Illyricum, Italy, Gaul, Spain, Britain, and Africa.

72
Procopius revolts.

After this partition, Valens returned to Conſtantinople; where the beginning of his reign was diſturbed by the revolt of Procopius, a relation of Julian. On the death of that emperor, he had fled into Taurica Cherſoneſus for fear of Jovian; but not truſting the barbarians who inhabited that country, he returned in diſguiſe into the Roman territories, where having gained over an eunuch of great wealth, by name *Eugenius*, lately diſgraced by Valens, and ſome officers who commanded the troops ſent againſt the Goths, he got himſelf proclaimed emperor. At firſt he was joined only by the loweſt of the people, but at length he was acknowledged by the whole city of Conſtantinople. On the news of this revolt, Valens would have abdicated the ſovereignty, had he not been prevented by the importunities of his friends. He therefore diſpatched ſome troops againſt the uſurper; but theſe were gained over, and Procopius continued for ſome time to gain ground. It is probable he would finally have ſucceeded, had he not become ſo much elated with his good fortune, that he grew tyrannical and inſupportable to his own party. In conſequence of this alteration in his diſpoſition, he was firſt abandoned by ſome of his principal officers; and ſoon after defeated in battle, taken priſoner, and put to death.

73
Is defeated and put to death.

74
War with the Goths.

This revolt produced a war betwixt Valens and the Goths. The latter, having been ſolicited by Procopius, had ſent 3000 men to his aſſiſtance. On hearing the news of the uſurper's death, they marched back; but Valens detached againſt them a body of troops, who took them all priſoners notwithſtanding the vigorous reſiſtance they made. Athanaric, king of the Goths, expoſtulated on this proceeding with Valens; but that emperor proving obſtinate, both parties prepared for war. In 367 and 369, Valens gained great advantages over his enemies; and obliged them to ſue for peace, which was concluded upon terms very advantageous to the Romans. The reſt of this reign contains nothing remarkable, except the cruelty with which Valens perſecuted the orthodox clergy. The latter ſent 80 of their number to him, in order to lay their complaints before him; but he, inſtead of giving them any relief, determined to put them all to death. But the perſon who was ordered to execute this ſentence, fearing leſt the public execution of ſo many eccleſiaſtics might raiſe diſturbances, ordered them all to be put on board a ſhip, pretending that the emperor had ordered them only to be ſent into baniſhment; but when the veſſel was at ſome diſtance from land, the mariners ſet fire to it, and made their own eſcape in the boat. The ſhip was driven by a ſtrong wind into a harbour, where it was conſumed and all that were in it. A perſecution was alſo commenced againſt magicians, or thoſe who had books of magic in their cuſtody. This occaſioned the deſtruction of many innocent perſons; for books of this kind were often conveyed into libraries unknown to the owners of them, and this was certainly followed by death and confiſcation of goods. Hereupon perſons of all ranks were ſeized with ſuch terror that they burnt their libraries, leſt books of magic ſhould have been ſecretly conveyed in amongſt the others. In 378, the Goths, whom Valens had admitted into Thrace, advanced from that province to Macedon and Theſſaly, where they committed dreadful ravages. They afterwards blocked up the city of Conſtantinople, plundered the ſuburbs, and at laſt totally defeated and killed the emperor himſelf. The day after the battle, hearing that an immenſe treaſure was lodged in Adrianople, the barbarians laid ſiege to that place; but being quite ſtrangers to the art of beſieging towns, they were repulſed with great ſlaughter; upon which they dropped that enterpriſe, and returned before Conſtantinople. But here great numbers of them were cut in pieces by the Saracens, whom Maria their queen had ſent to the aſſiſtance of the Romans; ſo that they were obliged to abandon this deſign likewiſe, and retire from the neighbourhood of that city.

75
Eighty orthodox eccleſiaſtics put to death.

76
Magicians perſecuted

77
Valens defeated and killed by the Goths

78
Gratian takes Thedoſius for his partne

By the death of Valens, the empire once more fell into the hands of a ſingle perſon. This was Gratian, who had held the empire of the Weſt after the death of Valentinian. He repulſed many barbarous nations who threatened the empire at that time with diſſolution; but finding himſelf preſſed on all ſides, he ſoon reſolved to take a colleague, in order to eaſe him of ſome part of the burden. Accordingly, on the 19th of January 379, he declared Theodoſius his partner in the empire, and committed to his care all the provinces which had been governed by Valens.

Theodoſius is greatly extolled by the hiſtorians of thoſe ages on account of his extraordinary valour and piety: and for theſe qualifications has been honoured with the ſurname of *the Great*. From the many perſecuting laws, however, made in his time, it would ſeem that his piety was at leaſt very much miſguided; and that if he was naturally of a humane and compaſſionate diſpoſition, ſuperſtition and paſſion had often totally obſcured it. He certainly was a man of great conduct and experience in war; and indeed the preſent ſtate of the empire called for an exertion of all his abilities. The provinces of Dacia, Thrace, and Illyricum, were already loſt; the Goths, Taifali, Alans, and Huns, were maſters of the greateſt part of theſe provinces, and had ravaged and laid waſte the reſt. The Iberians, Armenians, and Perſians, were likewiſe up in arms, and ready to take advantage of the diſtracted ſtate of the empire. The few ſoldiers who had

79
Miſerable ſtate of th empire on his acceſſion.

had ſurvived the late defeat, kept within the ſtrong holds of Thrace, without daring ſo much as to look abroad, much leſs face the victorious enemy, who moved about the country in great bodies. But notwithſtanding this critical ſituation, the hiſtorians of thoſe times give us no account of the tranſactions of the year 379. Many great battles indeed are ſaid to have been fought, and as many victories obtained by Theodoſius; but the accounts of theſe are ſo confuſed and contradictory, that no ſtreſs can be laid upon them.

In the month of February 380, Theodoſius was ſeized with a dangerous malady, ſo that Gratian found himſelf obliged to carry on the war alone. This emperor, apprehending that the neighbouring barbarians might break into ſome of the provinces, concluded a peace with the Goths, which was confirmed by Theodoſius on his recovery. The treaty was very advantageous to the barbarians; but they diſregarding all their engagements, no ſooner heard that Gratian had left Illyricum, than they paſſed the Danube, and breaking into Thrace and Pannonia, advanced as far as Macedon, deſtroying all with fire and ſword. Theodoſius, however, drawing together his forces, marched againſt them; and, according to the moſt reſpectable authorities, gained a complete victory; though Zoſimus relates, that he was utterly defeated.

80
The Goths defeated by Theodoſius.

The following year, Athanaric, the moſt powerful of all the Gothic princes, being driven out by a faction at home, recurred to Theodoſius, by whom he was received with great tokens of friendſhip. The emperor himſelf went out to meet him, and attended him with his numerous retinue into the city. The Gothic prince died the ſame year; and Theodoſius cauſed him to be buried after the Roman manner with ſuch pomp and ſolemnity, that the Goths, who attended him in his flight, returned home with a reſolution never to moleſt the Romans any more. Nay, out of gratitude to the emperor, they took upon them to guard the banks of the Danube, and prevent the empire from being invaded on that ſide.

81
Gratian murdered by Maximus.

82
Who invades the dominions of Valentinian.

In 383, one Maximus revolted againſt Gratian in Britain; and in the end, having got the unhappy emperor into his power, cauſed him to be put to death, and aſſumed the empire of the Weſt himſelf. Gratian had divided his dominions with his brother Valentinian, whom he allowed to reign in Italy and Weſt Illyricum, reſerving the reſt to himſelf. Maximus, therefore, immediately after his uſurpation, ſent deputies to Theodoſius, aſſuring him that he had no deſigns on the dominions of Valentinian. As Theodoſius at that time found himſelf in danger from the barbarians, he not only forbore to attack Maximus after this declaration, but even acknowledged him for his partner in the empire. It was not long, however, before the ambition of the uſurper prompted him to break his promiſe. In 387, he paſſed the Alps on a ſudden; and meeting with no oppoſition, marched to Milan where Valentinian uſually reſided. The young prince fled firſt to Aquileia; and from thence to Theſſalonica, to implore the protection of Theodoſius. The latter, in anſwer to Valentinian's letter, informed him, that he was not at all ſurpriſed at the progreſs Maximus had made, becauſe the uſurper had protected, and Valentinian had perſecuted, the orthodox Chriſtians. At laſt he prevailed on the young prince to renounce the Arian hereſy which he had hitherto maintained; after which Theodoſius promiſed to aſſiſt him with all the forces of the Eaſt. At firſt, however, he ſent meſſengers to Maximus, earneſtly exhorting him to reſtore the provinces he had taken from Valentinian, and content himſelf with Gaul, Spain, and Britain. But the uſurper would hearken to no terms. This very year he beſieged and took Aquileia, Quaderna, Bononia, Mutina, Rhegium, Placentia, and many other cities in Italy. The following year he was acknowledged in Rome, and in all the provinces of Africa. Theodoſius, therefore, finding a war inevitable, ſpent the remaining months of this and the beginning of the following year in making the neceſſary preparations. His army conſiſted chiefly of Goths, Huns, Alans, and other barbarians, whom he was glad to take into the ſervice in order to prevent their raiſing diſturbances on the frontiers. He defeated Maximus in two battles, took him priſoner, and put him to death. The uſurper had left his ſon Victor, whom he created Auguſtus, in Gaul, to awe the inhabitants in his abſence. Againſt him the emperor deſpatched Arbogaſtes, who took him priſoner after having diſperſed the troops that attended him, and put him to death. The victory was uſed afterwards by Theodoſius with great clemency and moderation.

83
His ſucceſs.

84
Defeated and put to death by Theodoſius.

85
The temples in Alexandria, and throughout all Egypt deſtroyed.

In 389, Theodoſius took a journey to Rome; and, according to Prudentius, at this time converted the ſenate and people from idolatry to Chriſtianity. The next year was remarkable for the deſtruction of the celebrated temple of Serapis in Alexandria; which, according to the deſcription of Ammianus Marcellinus, ſurpaſſed all others in the world, that of Jupiter Capitolinus alone excepted. The reaſon of its being now deſtroyed was as follows. Theophilus, biſhop of Alexandria, having begged and obtained of the emperor an old temple, formerly conſecrated to Bacchus, but then ruined and forſaken, with a deſign to convert it into a church, the workmen found among the rubbiſh ſeveral obſcene figures, which the biſhop, to ridicule the ſuperſtition of the Heathens, cauſed to be expoſed to public view. This provoked the Pagans to ſuch a degree, that they flew to arms; and falling unexpectedly upon the Chriſtians, cut great numbers of them in pieces. The latter, however, ſoon took arms in their own defence; and being ſupported by the few ſoldiers who were quartered in the city, began to repel force by force. Thus a civil war was kindled, and no day paſſed without ſome encounter. The Pagans uſed to retire to the temple of Serapis; and thence ſallying out unexpectedly ſeized on ſuch Chriſtians as they met, and dragging them into the temple, either forced them by the moſt exquiſite torments to ſacrifice to their idol, or, if they refuſed, racked them to death. As ſoon as they expected to be attacked by the emperor's troops, they choſe a philoſopher named *Olympus* for their leader, with a deſign to defend themſelves to the laſt extremity. The emperor, however, would not ſuffer any puniſhment to be inflicted upon them for the lives of thoſe they had taken away, but readily forgave them; however, he ordered all the temples of Alexandria to be immediately pulled down, and commanded the biſhop to ſee his orders put in execution. The Pagans no ſooner heard that the emperor was acquainted with their proceedings than they abandoned the temple, which was in a ſhort time deſtroyed by Theophilus; nothing being left except the foundations, which could not be removed on account of the extraordinary weight and ſize of the ſtones. Not ſatisfied with the deſtruction of the Alexandrian temples, the zealous biſhop encouraged the people to pull down all the other temples, oratories, chapels, and places ſet apart for the worſhip of the Heathen gods throughout Egypt, and the ſtatues of the gods themſelves to be either burnt or melted down. Of the innumerable ſtatues which at that time were to be found in Egypt, he is ſaid to have ſpared but one, viz. that of an ape, in order to expoſe the Pagan religion to ridicule. On his return to Conſtantinople, Theodoſius ordered ſuch temples as were yet ſtanding to be thrown down, and the Arians to be everywhere driven out of the cities.

86.
Valentinian murdered by Arbogaſtes, who raiſes Eugenius to the empire.

In 392, Valentinian, emperor of the Weſt, was treacherouſly murdered by Arbogaſtes his general; who, though he might afterwards have eaſily ſeized on the ſovereignty himſelf, choſe to confer it upon one Eugenius, and to reign in his name. This new uſurper, though a Chriſtian, was greatly favoured by the Pagans, who were well apprized that he only bore the title of emperor, while the whole power lodged in Arbogaſtes, who pretended to be greatly attached to their religion. The aruſpices began to appear anew, and informed him that he was deſtined to the empire of the whole world; that he would ſoon gain a complete victory over Theodoſius, who was as much hated as Eugenius was beloved by the gods, &c. But though Eugenius ſeemed to favour the Pagans, yet in the very beginning of his reign he wrote to St Ambroſe. The holy man did not anſwer his letter till he was preſſed by ſome friends to recommend them to the new prince; and then he wrote to this infamous uſurper with all the reſpect due to an emperor. Soon after his acceſſion to the empire, Eugenius ſent deputies to Theodoſius; and they are ſaid to have been received by him in a very obliging manner. He did not, however, intend to enter into any alliance with this uſurper, but immediately began his military preparations. In 394, he ſet out from Conſtantinople, and was at Adrianople on the 15th of June that year. He bent his march through Dacia, and the other provinces between Thrace and the Julian Alps, with a deſign to force the paſſes of theſe mountains, and break into Italy before the army of Eugenius was in a condition to oppoſe him. On his arrival at the Alps, he found theſe paſſes guarded by Flavianus prefect of Italy, at the head of a conſiderable body of Roman troops. Theſe were utterly defeated by Theodoſius, who thereupon croſſed the Alps and advanced into Italy. He was ſoon met by Eugenius; and a bloody battle enſued, without any deciſive advantage on either ſide. The next day the emperor led his troops in perſon againſt the enemy, utterly defeated them, and took their camp.

87
Eugenius defeated, taken priſoner, and put to death.

Eugenius was taken priſoner by his own men, and brought to Theodoſius, who reproached him with the murder of Valentinian, with the calamities he had brought on the empire by his unjuſt uſurpation, and with putting his confidence in Hercules, and not in the true God; for on his chief ſtandard he had diſplayed the image of that fabulous hero. Eugenius begged earneſtly for his life; but while he lay proſtrate at the emperor's feet, his own ſoldiers cut off his head, and carrying it about on the point of a ſpear, ſhowed it to thoſe in the camp, who had not yet ſubmitted to Theodoſius. At this they were all thunderſtruck; but being informed that Theodoſius was ready to receive them into favour, they threw down their arms and ſubmitted.

88
Arbogaſtes lays violent hands on himſelf.

After this, Arbogaſtes, deſpairing of pardon, fled to the mountains; but being informed that diligent ſearch was made for him, he laid violent hands on himſelf. His children, and thoſe of Eugenius, took ſanctuary in churches; but the emperor not only pardoned, but took the opportunity of converting them to Chriſtianity, reſtored them to their paternal eſtates, and raiſed them to conſiderable employments in the ſtate. Soon after this, Theodoſius appointed his ſon Honorius emperor of the weſt, aſſigning him for his ſhare Italy, Gaul, Spain, Africa, and Weſt Illyricum. The next year, as he prepared for his return to Conſtantinople, he was ſeized with a dropſy, owing to the great fatigues he had undergone during the war.

89
Theodoſius dies.

As ſoon as he perceived himſelf to be in danger, he made his will; by which he bequeathed the empire of the eaſt to Arcadius, and confirmed Honorius in the poſſeſſion of the weſt. He likewiſe confirmed the pardon which he had granted to all thoſe who had borne arms againſt him, and remitted a tribute which had proved very burdenſome to the people; and charged his two ſons to ſee theſe points of his will executed. He died at Milan on the 17th of January 395, in the 16th year of his reign and 50th of his age.

90
Empire uſurped by Baſiliſcus.

From the time of Theodoſius to the time when the Roman empire in the weſt was totally deſtroyed by the Goths, we find but very little remarkable in the hiſtory of Conſtantinople. At this time the eaſtern empire was uſurped by Baſiliſcus, who had driven out Zeno the lawful emperor; being aſſiſted in his conſpiracy by the empreſs Verina his ſiſter. Zeno fled into Iſauria, whither he was purſued by Illus and Trecondes, two of the uſurper's generals; who having eaſily defeated the few troops he had with him, forced the unhappy prince to ſhut himſelf up in a caſtle, which they immediately inveſted. But in a ſhort time Baſiliſcus having diſobliged the people by his cruelty, avarice, and other bad quatities, for which he was no leſs remarkable than his predeceſſor had been, his generals joined with Zeno, whom they reſtored to the throne.

91
Is ſtarved to death.

After his reſtoration, Zeno having got Baſiliſcus into his power, confined him in a caſtle of Cappadocia together with his wife Zenonides, where they both periſhed with hunger and cold. This happened in the year 467, after Baſiliſcus had reigned about 20 months.

92
Great fire at Conſtantinople.

During the time of this uſurpation a dreadful fire happened at Conſtantinople, which conſumed great part of the city, with the library containing 120,000 volumes; among which were the works of Homer, written, as is ſaid, on the great gut of a dragon 120 feet long.

The misfortutues which Zeno had undergone did not work any reformation upon him. He ſtill continued the ſame vicious courſes which had given occaſion to the uſurpation of Baſiliſcus. Other conſpiracies were formed againſt him, but he had the good fortune to eſcape them. He engaged in a war with the Oſtrogoths, in which he proved unſucceſsful, and was obliged to yield the provinces of Lower Dacia and Mœſia to them. In a ſhort time, however, Theodoric their king made an irruption into Thrace, and advanced within 15 miles of Conſtantinople, with a deſign to beſiege that capital: but the following year, 485, they retired in order to attack Odoacer king of Italy; of which country Theodoric was proclaimed king in 493. The emperor Zeno died in the year 491, in the 65th year of his age, and 17th of his reign.

93
Decline of the Roman empire, to what owing.

The Roman empire had now for a long time been on the decline: the ancient valour and military diſcipline which had for ſuch a long time rendered the Romans ſuperior to other nations, had greatly degenerated; ſo that they were now by no means ſo powerful as formerly. The tumults and diſorders which had happened in the empire from time to time by the many uſurpations, had contributed alſo to weaken it very much. But what proved of the greateſt detriment was the allowing vaſt ſwarms of barbarians to ſettle in the different provinces, and to ſerve in the Roman empire in ſeparate and independent bodies. This had proved the immediate cauſe of the diſſolution of the weſtern empire; but as it affected the eaſtern parts leſs, the Conſtantinopolitan empire continued for upwards of 900 years after the weſtern one was totally diſſolved. The weak and imprudent adminiſtration of Zeno, and Anaſtaſius who ſucceeded him, had reduced the eaſtern empire ſtill more; and it might poſſibly have expired in a ſhort time after the weſtern one, had not the wiſe and vigorous conduct of Juſtin, and his partner Juſtinian, revived in ſome meaſure the ancient martial ſpirit which had originally raiſed the Roman empire to its higheſt pitch of grandeur.

94
It revives under Juſtin and Juſtinian.

Juſtin aſcended the throne in 518. In 521 he engaged in a war with the Perſians, who had all along been very formidable enemies to the Roman name. Againſt them he employed the famous Beliſarius; but of him we hear nothing remarkable till after the acceſſion of Juſtinian. This prince was the nephew of Juſtin, and was by him taken as his partner in the empire in 527; and the ſame year Juſtin died, in the 77th year of his age and 9th of his reign. Juſtinian being now ſole maſter of the empire, bent his whole force againſt the Perſians. The latter proved ſucceſsful in the firſt engagement; but were ſoon after utterly defeated by Beliſarius on the frontiers of Perſia, and likewiſe by another general named *Dorotheus* in Armenia. The war continued with various ſucceſs during the firſt five years of Juſtinian's reign. In the ſixth year a peace was concluded upon the following terms: 1. That the Roman emperor ſhould pay to Coſrhoes, the king of Perſia, 1000 pounds weight of gold. 2. That both princes ſhould reſtore the places they had taken during the wars. 3. That the commander of the Roman forces ſhould no longer reſide at Daras on the Perſian frontiers, but at a place called *Conſtantina* in Meſopotamia, as he had formerly done. 4. That the Iberians, who had ſided with the Romans, ſhould be at liberty either to return to their own country or to remain at Conſtantinople. This peace, concluded in 532, was ſtyled *eternal;* but in the event proved of very ſhort duration.

95
Juſtinian's war with the Perſians.

96
Great tumult in Conſtantinople.

About this time happened at Conſtantinople the greateſt tumult mentioned in hiſtory. It began among the different factions in the circus, but ended in an open rebellion. The multitude, highly diſſatisfied with the conduct of John the *prefectus prætorio*, and of Trebonianus then queſtor, forced Hypatius, nephew to the emperor Anaſtaſius, to accept the empire, and proclaimed him with great ſolemnity in the forum. As the two above-mentioned miniſters were greatly abhorred by the populace on account of their avarice, Juſtinian immediately diſcharged them, hoping by that means to appeaſe the tumult: but this was ſo far from anſwering the purpoſe, that the multitude only grew the more outrageous upon it; and moſt of the ſenators joining them, the emperor was ſo much alarmed, that he had thoughts of abandoning the city and making his eſcape by ſea. In this dilemma the empreſs Theodora encouraged and perſuaded him rather to part with his life than the kingdom; and he at laſt reſolved to defend himſelf to the utmoſt, with the few ſenators who had not yet abandoned him. In the mean time, the rebels having attempted in vain to force the gates of the palace, carried Hypatius in triumph to the circus; where, while he was beholding the ſports from the imperial throne, amidſt the ſhouts and acclamations of the people, Beliſarius, who had been recalled from Perſia, entered the city with a conſiderable body of troops. Being then appriſed of the uſurpation of Hypatius, he marched ſtraight to the circus; fell ſword in hand upon the diſarmed multitude; and with the aſſiſtance of a band of Heruli, headed by Mundus governor of Illyricum, cut about 30,000 of them in pieces. Hypatius the uſurper, and Pompeius another of the nephews of Anaſtaſius, were taken priſoners and carried to the emperor, by whoſe orders they were both beheaded, and their bodies caſt into the ſea. Their eſtates were confiſcated, and likewiſe the eſtates of ſuch ſenators as had joined with them; but the emperor cauſed great part of their lands and effects to be afterwards reſtored, together with their honours and dignities, to their children.

Juſtinian having now no other enemy to contend with, turned his arms againſt the Vandals in Africa, and the Goths in Italy; both which provinces he recovered out of the hands of the barbarians*. But before his general Beliſarius had time to eſtabliſh fully the Roman power in Italy, he was recalled in order to carry on the war againſt Coſrhoes king of Perſia, who, in defiance of the treaty formerly concluded in 532, entered the Roman dominions at the head of a powerful army. The ſame year, however, a peace was concluded between the two nations upon the following conditions: 1. That the Romans ſhould, within two months, pay to the Perſian king 5000 pounds weight of gold, and an annual penſion of 500. 2. That the Perſians ſhould relinquiſh all claim to the fortreſs of Daras, and maintain a body of troops to guard the Caſpian gates, and prevent the barbarians from breaking into the empire. 3. That upon payment of the above-mentioned ſum, Coſrhoes ſhould immediately withdraw his troops from the Roman dominions. The treaty being ſigned, and the ſtipulated ſum paid, Coſrhoes began to march back again; but by the way plundered ſeveral cities as if the war had ſtill continued. Hereupon Juſtinian reſolved to purſue the war with the utmoſt vigour; and for that purpoſe deſpatched

97
Another war with the Perſians.

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*See *Barbary* and *Goths*.

patched Beliſarius into the eaſt. But ſoon after he was obliged to recal him in order to oppoſe the Goths who had gained great advantages in Italy after his departure.

98 Peace concluded.

The Perſian war was then carried on with indifferent ſucceſs till the year 558, when a peace was concluded upon the emperor again paying an immenſe ſum to the enemy. The ſame year the Huns, paſſing the Danube in the depth of winter, marched in two bodies directly for Conſtantinople; and laying waſte the countries through which they paſſed, came, without meeting the leaſt oppoſition, within 150 furlongs of the city. But Beliſarius marching out againſt them with a handful of men, put them to flight; the emperor, however, to prevent them from invading the empire anew, agreed to pay them an annual tribute, upon their promiſing to defend the empire againſt all other barbarians, and to ſerve in the Roman armies when required. This was the laſt exploit performed by Beliſarius, who on his return to Conſtantinople was diſgraced, ſtripped of all his employments, and confined to his houſe, on pretence of a conſpiracy againſt the emperor *. In the year 565 a real conſpiracy was formed againſt Juſtinian, which he happily eſcaped, and the conſpirators were executed; but the emperor did not long ſurvive it, being carried off by a natural death in 566, in the 39th year of his reign.

During the reign of Juſtinian, the majeſty of the Roman empire ſeemed to revive. He recovered the provinces of Italy and Africa out of the hands of the barbarians, by whom they had been held for a number of years; but after his death they were ſoon loſt, and the empire tended faſt to diſſolution.

99 Decline of the empire after Juſtinian.

In 569 Italy was conquered by the Lombards, who held it for the ſpace of 200 years. Some amends, however, was made for the loſs by the acquiſition of *Perſarmenia*; the inhabitants of which, being perſecuted by the Perſians on account of the Chriſtian religion which they profeſſed, revolted to the Romans. This produced a war between the two nations, who continued to weaken each other, till at laſt the Perſian monarchy was utterly overthrown, and that of the Romans greatly reduced by the Saracens †. Theſe new enemies attacked the Romans in the year 632, and purſued their conqueſts with incredible rapidity. In the ſpace of four years they reduced the provinces of Egypt, Syria, and Paleſtine. In 648 they were alſo maſters of Meſopotamia, Phœnicia, Africa, Cyprus, Aradus, and Rhodes; and having defeated the Roman fleet, commanded by the emperor Conſtans in perſon, they concluded a peace on condition of keeping the vaſt extent of territory they had ſeized, and paying for it 1000 nummi a-year.

100 Unſucceſsful expedition againſt the Lombards

An expedition againſt the Lombards was about this time undertaken, but with very little ſucceſs, a body of 20,000 Romans being almoſt entirely cut off by one of the Lombard generals.

101 Conſtantinople beſieged by the Saracens.

In 671 the Saracens ravaged ſeveral provinces, made a deſcent in Sicily, took and plundered the city of Syracuſe, and overran the whole iſland, deſtroying every thing with fire and ſword. In like manner they laid waſte Cilicia; and having paſſed the winter at Smyrna, they entered Thrace in the winter of the year 672, and laid ſiege to Conſtantinople itſelf. Here, however, they were repulſed with great loſs: but next ſpring they renewed their attempt in which they met with the ſame bad ſucceſs; many of their ſhips being burnt by the *ſea-fire*, as it was called, becauſe it burnt under water: and in their return home their fleet was wrecked off the Scyllæan promontory. At laſt a peace was concluded for 30 years, on condition that the Saracens ſhould retain all the provinces they had ſeized; and that they ſhould pay to the emperor and his ſucceſſors 3000 pounds weight of gold, 50 ſlaves, and as many choice horſes.

102 Empire invaded by the Bulgarians.

This peace was ſcarce concluded, when the empire was invaded by a new enemy, who proved very troubleſome for a long time. Theſe were the Bulgarians: who breaking into Thrace, defeated the Roman army ſent againſt them, and ravaged the country far and wide. The emperor conſented to pay them an annual penſion, rather than continue a doubtful war; and allowed them to ſettle in Lower Mœſia, which from them was afterwards called *Bulgaria*. In 687, they were attacked by Juſtinian II. who entered their country without provocation, or regarding the treaties formerly concluded with them. But they falling ſuddenly upon him, drove him out of their country, and obliged him to reſtore the towns and captives he had taken. In 697, this emperor was depoſed; and in his exile fled to Trebelis king of the Bulgarians, by whom he was kindly entertained, and by whoſe means he was reſtored to his throne; but ſoon forgetting this favour, he invaded the country of the Bulgarians, with a deſign to wreſt from them thoſe provinces which he had yielded to them.

103 They defeat Juſtinian II.

He was attended in this expedition by no better ſucceſs than his ingratitude deſerved, his army being utterly defeated, and he himſelf obliged to make his eſcape in a light veſſel to Conſtantinople. The Bulgarians continued their inroads and ravages at different times, generally defeating the Romans who ventured to oppoſe them, till the year 800, the ſeventh of the reign of Nicephorus, when they ſurpriſed the city of Sardica in Mœſia, and put the whole garriſon, conſiſting of 6000 men, to the ſword. The emperor marched againſt them with a conſiderable army: but the enemy retired at his approach; and he, inſtead of purſuing them, returned to Conſtantinople.

104 Their country cruelly ravaged by Nicephorus.

Two years after, he entered Bulgaria at the head of a powerful army, deſtroying every thing with fire and ſword. The king offered to conclude a peace with him upon honourable terms; but Nicephorus, rejecting his propoſals, continued to waſte the country, deſtroying the cities, and putting all the inhabitants without diſtinction of ſex or age, to the ſword. The king was ſo much affected with theſe cruelties which were exerciſed on his ſubjects, that he ſent a ſecond embaſſy to Nicephorus, offering to conclude a peace with him upon any terms, provided he would quit his country.

105 Who is cut off with his whole army.

But Nicephorus diſmiſſing the ambaſſadors with ſcorn, the Bulgarian monarch attacked unexpectedly the Roman camp, forced it, and cut off almoſt the whole army, with the emperor himſelf, and a great number of patricians. His ſucceſſor Michael likewiſe engaged in a war with the Bulgarians; but being utterly defeated, he was ſo grieved that he reſigned the empire. After this the Bulgarians continued to be very formidable enemies to the empire, till the year 979, when they were attacked by Baſilius II.

106 Their country invaded by Baſilius II.

The Bulgarians were at that time governed by a king named *Samuel*; who having ravaged the Roman territories,

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* See *Beliſarius*.

† See *Arabia*.

tories, as was the common practice of his nation, Baſilius ſent againſt him one Nicephorus Uranus at the head of a powerful army. Uranus, leaving his baggage at Lariſſa, reached by long marches the Sperchius, and encamped with his whole army over againſt the enemy, who lay on the oppoſite bank. As the river was greatly ſwelled with the heavy rains that had lately fallen, Samuel, not imagining the Romans would attempt to paſs it, ſuffered his troops to roam in large parties about the country in queſt of booty. But Uranus having at length found out a place where the river was fordable, paſſed it in the dead of the night without being perceived. He then fell upon the Bulgarians who were left in the camp, and lay for the moſt part aſleep; cut great numbers of them in pieces; took a great number of priſoners, with all their baggage; and made himſelf maſter of their camp. Samuel and his ſon were dangerouſly wounded; and would have been taken, had they not all that day concealed themſelves among the dead. The next night they ſtole away to the mountains of Ætolia, and from thence made their eſcape into Bulgaria. The following year the emperor entered Bulgaria at the head of a numerous and well-diſciplined army; defeated Samuel in a pitched battle, and took ſeveral ſtrong cities. The emperor himſelf, however, at laſt, narrowly eſcaped being cut off with his whole army; being unexpectedly attacked by the Bulgarians in a narrow paſs. From this danger he was relieved by the arrival of Nicephorus Xiphias, governor of Philippopolis, with a conſiderable body of troops; who falling upon the enemies rear, put them to flight.

107 His monſtrous cruelty.

Baſilius purſued them cloſe; and having taken an incredible number of captives, cauſed their eyes to be pulled out, leaving to every hundred a guide with one eye, that he might conduct them to Samuel. This ſhocking ſpectacle ſo affected the unhappy king, that he fell into a deep ſwoon, and died two days after. The Roman emperor purſued his conqueſts, and in the ſpace of two years made himſelf maſter of moſt of the enemies ſtrong holds.

108 The country ſubdued.

He defeated alſo the ſucceſſor of Samuel in ſeveral engagements; and having at laſt killed him in battle, the Bulgarians ſubmitted themſelves without reſerve. The vaſt treaſures of their princes were by Baſilius diſtributed among his ſoldies by way of donative. Soon after, the widow of the late king, with her ſix daughters and three of her ſons, ſurrendered themſelves to the Roman emperor, by whom they were received with the utmoſt civility and reſpect. This obliging behaviour encouraged the three other ſons of the late king, and moſt of the princes of the blood, who had taken ſhelter in the mountains, to ſubmit, and throw themſelves on the emperor's mercy.

109 Ibatzes alone holds out.

Ibatzes, however, a perſon nearly allied to the royal family, who had diſtinguiſhed himſelf in a very eminent manner during the whole courſe of the war, refuſed to ſubmit, and fled to a ſteep and craggy mountain with a deſign to defend himſelf there to the laſt extremity. Baſilius endeavoured to cauſe him ſubmit by fair means, but he equally deſpiſed both threats and promiſes.

110 He is taken by a ſtratagem.

At laſt Euſtathius Daphnomelus, whom Baſilius had lately appointed governor of Achridus, the chief city of Bulgaria, undertook to ſecure him by a moſt deſperate and improbable ſcheme. Without communicating his deſign to any, he repaired, with two perſons in whom he could confide, to the mountain on which Ibatzes had fortified himſelf. He hoped to paſs undiſcovered among the many ſtrangers who flocked thither to celebrate the approaching feaſt of the Virgin Mary, for whom Ibatzes had a particular veneration. In this he found himſelf miſtaken; for he was known by the guards, and carried before the prince. To him he pretended to have ſomething of importance to communicate; but as ſoon as Ibatzes had retired with him into a remote place, Daphnomelus threw himſelf ſuddenly upon him, and with the aſſiſtance of the two men whom he had brought with him, pulled out both his eyes, and got ſafe to an abandoned caſtle on the top of the hill. Here they were immediately ſurrounded by the troops of Ibatzes; but Daphnomelus exhorting them now to ſubmit to the emperor, by whom he aſſured them they would be well received, they congratulated Daphnomelus on his ſucceſs, and ſuffered him to conduct the unhappy Ibatzes a priſoner to Baſilius. The emperor was no leſs ſurpriſed than pleaſed at the ſucceſs of the bold attempt; and rewarded Daphnomelus with the government of Dyrrhachium, and all the rich moveables of his priſoner. After this, having accompliſhed the entire reduction of Bulgaria, he returned to Conſtantinople with an incredible number of captives, where he was received by the ſenate and people with all poſſible demonſtrations of joy.

111 The empire invaded by the Turks.

112 Account of them.

All this time the Saracens had at intervals invaded the Roman diminions, and even attempted to make themſelves maſters of Conſtantinople. Their internal diviſions, however, rendered them now much leſs formidable enemies than they had formerly been; ſo that ſome provinces were even recovered for a time out of their hands; though the weak and diſtracted ſtate of the empire rendered it impoſſible to preſerve ſuch conqueſts. But in 1041, the empire was invaded by an enemy, not very powerful at that time indeed, but who by degrees gathered ſtrength ſufficient to overthrow both the Roman and Saracen empires. Theſe were the Turks; who having quitted their ancient habitations in the neighbourhood of Mount Caucaſus, and paſſed the Caſpian ſtraits, ſettled in Armenia Major, about the year 844. There they continued an unknown and deſpicable people, till the inteſtine wars of the Saracens gave them an opportunity of aggrandizing themſelves. About the year 1030, Mohammed the ſon of Sambrael ſultan of Perſia, not finding himſelf a match for Piſaris ſultan of Babylon, with whom he was at war, had recourſe to the Turks, who ſent him 3000 men under the command of Tangrolipix, a leading man among them. By their aſſiſtance Mohammed defeated his adverſary; but when the Turks deſired leave to return home, he refuſed to part with them. Upon this they withdrew without his conſent to a neighbouring deſert; and being there joined by ſeveral diſcontented Perſians, began to make frequent inroads into the ſultan's territories. Againſt them Mohammed immediately diſpatched an army of 20,000 men; who being ſurpriſed in the night, were utterly defeated by Tangrolipix. The fame of this victory drew multitudes to him from all parts; ſo that in a ſhort time Tangrolipix ſaw himſelf at the head of 50,000 men. Upon this Mohammed marched againſt them in perſon, but was thrown from his horſe in the beginning of the engagement, and killed by the fall; upon which his men threw down their arms, and ſubmitted to Tangrolipix.

113 They defeat the Romans.

114 A Turkiſh army entirely cut off.

115 They again invade the empire.

116 An obſtinate engagement.

After this victory the Turkiſh general made war upon the ſultan of Babylon; whom he at length ſlew, and annexed his dominions to his own. He then ſent his nephew, named *Cutlu-Moſes*, againſt the Arabians; but by them he was defeated, and forced to fly towards Media. Through this province he was denied a paſſage by Stephen the Roman governor; upon which Cutlu-Moſes was obliged to force a paſſage by encountering the Roman army. Theſe he put to flight, took the governor himſelf priſoner, and without any further oppoſition reached the confines of Perſia, where he ſold Stephen for a ſlave. Returning from thence to Tangrolipix, he excuſed, in the beſt manner he could, his defeat by the Arabians; but at the ſame time acquainted him with his victory over the Romans in Media, encouraging him to invade that fertile country, which he ſaid might be eaſily conquered, as it was inhabited by none but *women*, meaning the Romans. At that time Tangrolipix, did not hearken to his advice, but marched againſt the Arabians at the head of a numerous army. He was, however, attended with no better ſucceſs than his nephew had been; and therefore began to reflect on what he had told him. Soon after he ſent Aſan his brother's ſon with an army of 20,000 men to reduce Media. Purſuant to his orders, the young prince entered that country, and committed everywhere dreadful ravages; but being in the end drawn into an ambuſh by the Roman generals, he was cut off with his whole army. Tangrolipix, no way diſcouraged by this misfortune, ſent a new army into Media near 100,000 ſtrong; who, after having ravaged the country without oppoſition, laid ſiege to Artza a place of great trade, and therefore reckoned the moſt wealthy in thoſe parts. Not being able to reduce it by any other means, they ſet it on fire; and thus in a ſhort time it was utterly deſtroyed: the buildings being reduced to aſhes, and 150,000 of the inhabitants periſhed either by the flames or the ſword. After this Abraham Halim, half-brother to Tangrolipix, hearing that the Romans, reinforced with a body of troops under the command of Liparites governor of Iberia, had taken the field, marched againſt them, and offered them battle; which they not declining, the two armies engaged with incredible fury. The victory continued long doubtful; but at length inclined to the Romans; who nevertheleſs did not think proper to purſue the fugitives, as their general Liparites was taken priſoner. The emperor, greatly concerned for the captivity of Liparites, diſpatched ambaſſadors with rich preſents, and a large ſum of money to redeem him, and at the ſame time to conclude an alliance with Tangrolipix. The ſultan received the preſents; but generouſly returned them together with the money to Liparites, whom he ſet at liberty without any ranſom; only requiring him, at his departure, never more to bear arms againſt the Turks. Not long after, Tangrolipix ſent a perſon of great authority among the Turks, with the character of ambaſſador, to Conſtantinople; who having arrogantly exhorted the emperor to ſubmit to his maſter, and acknowledge himſelf his tributary, was ignominiouſly driven out of the city.

117 The Turks beſiege Mantzichierta.

118 The ſiege raiſed.

Tangrolipix, highly affronted at the reception his ambaſſador had met with, entered Iberia while the emperor Conſtantine Monomachus was engaged in a war with the Patzinacæ, a Scythian nation. Having ravaged that country, he returned from thence to Media, and laid ſiege to Mantzichierta, a place defended by a numerous garriſon, and fortified with a triple wall and deep ditches. However, as it was ſituated in an open plain country, he hoped to be maſter of it in a ſhort time. But finding the beſieged determined to defend themſelves to the laſt extremity, he reſolved to raiſe the ſiege, after he had continued it 30 days. One of his officers, however, named *Alcan*, prevailed on him to continue it but one day longer, and to commit the management of the attacks to him. This being granted, Alcan diſpoſed his men with ſuch ſkill, and ſo encouraged them by his example, that, notwithſtanding the vigorous oppoſition they met with, the place would have probably been taken, had not Alcan been ſlain as he was mounting the wall. The beſieged, knowing him by the richneſs of his armour, drew him by the hair into the city, and cutting off his head threw it over the wall among the enemy; which ſo diſheartened them, that they gave over the aſſault and retired. The next ſpring Tangrolipix returned, and ravaged Iberia with the utmoſt cruelty, ſparing neither ſex nor age. But on the approach of the Roman army he retired to Tauris, leaving 30,000 men behind him to infeſt the frontiers of the empire. This they did with great ſucceſs, the borders being through the avarice of Monomachus unguarded. Till the time of this emperor, the provinces bordering on the countries of the barbarians had maintained, at their own charge, forces to defend them; and were on that account exempted from paying tribute; but as Monomachus exacted from them the ſame ſums that were paid by others, they were no longer in a condition to defend themſelves.

119 The empreſs Eudocia forced to ſwear that ſhe will never marry.

In 1062 died the emperor Conſtantine Ducas, having left the empire to his three ſons, Michael, Andronicus, and Conſtantine; but as they were all very young, he appointed the empreſs Eudocia, regent during their minority, after having required of her an oath never to marry; which oath was with great ſolemnity lodged in the hands of the patriarch. He likewiſe obliged the ſenators ſolemnly to ſwear that they would acknowledge none for their ſovereign but his three ſons. No ſooner, however, was he dead, than the Turks, hearing that the empire was governed by a woman, broke into Meſopotamia, Cilicia, and Cappadocia, deſtroying all with fire and ſword. The empreſs was no way in a condition to oppoſe them, the greater part of the army having been diſbanded in her huſband's life-time, and the troops that were ſtill on foot being undiſciplined, and altogether unfit for ſervice. The concern which this gave the empreſs was aggravated by the ſeditious ſpeeches of a diſcontented party at home, who repeated on all occaſions that the preſent ſtate of affairs required a man of courage and addreſs at the helm, inſtead of a weak and helpleſs woman; and as they imagined the empreſs would never think of marrying, in conſequence of the oath ſhe had taken, they hoped by theſe ſpeeches to induce the people to revolt, and chooſe a new emperor.

120
The empreſs determines to break her oath.

This Eudocia was aware of; and therefore determined to prevent the evils that threatened herſelf and her family, by marrying ſome perſon of merit who was capable of defeating her enemies both at home and abroad. At this time one Romanus Diogenes, a perſon of a moſt beautiful aſpect, extraordinary parts, and illuſtrious birth, being accuſed of aſpiring to the empire, tried and convicted, was brought forth to receive ſentence of death. But the empreſs, touched with compaſſion at his appearance, gently upbraided him with his ambition, ſet him at liberty, and ſoon after appointed him commander in chief of all her forces.

121
She recovers the writing in which it was contained,

In this ſtation he acquitted himſelf ſo well, that the empreſs reſolved to marry him if ſhe could but recover the writing in which her oath was contained out of the hands of the patriarch. In order to this, ſhe applied to a favourite eunuch; who going to the patriarch, told him that the empreſs was ſo taken with his nephew named *Bardas*, that ſhe was determined to marry and raiſe him to the empire, provided the patriarch abſolved her from the oath ſhe had taken, and convinced the ſenate of the lawfulneſs of her marriage. The patriarch, dazzled with the proſpect of his nephew's promotion, readily undertook to perform both. He firſt obtained the conſent of the ſenate by repreſenting to them the dangerous ſtate of the empire, and exclaiming againſt the raſh oath which the jealouſy of the late emperor had extorted from the empreſs. He then publicly diſcharged her from it; reſtored the writing to her; and exhorted her to marry ſome deſerving object, who being entruſted with an abſolute authority, might be capable of defending the empire.

122
and marries Romanus Diogenes.

The empreſs, thus diſcharged from her oath, married a few days after Romanus Diogenes; who was thereupon proclaimed emperor, to the great diſappointment of the patriarch.

123
He paſſes over into Aſia.

As the new emperor was a man of great activity and experience in war, he no ſooner ſaw himſelf veſted with the ſovereign power, than he took upon him the command of the army, and paſſed over into Aſia with the few forces he could aſſemble, recruiting and inuring them on his march to military diſcipline, which had been utterly neglected in the preceding reigns. On his arrival in that continent, he was informed that the Turks had ſurpriſed and plundered the city of Neocæſarea, and were retiring with their booty.

124
He defeats the Turks.

On this news he haſtened after them at the head of a choſen body of light-armed troops, and came up with them on the third day. As the Turks were marching in diſorder, without the leaſt apprehenſion of an enemy, Romanus cut great numbers of them in pieces, and eaſily recovered the booty; after which he purſued his march to Aleppo, which he retook from them, together with Hierapolis, where he built a ſtrong caſtle.

125
Gains a ſecond victory.

As he was returning to join the forces he had left behind him, he was met by a numerous body of Turks who attempted to cut off his retreat. At firſt he pretended to decline an engagement through fear; but attacked them afterwards with ſuch vigour when they leaſt expected it, that he put them to flight at the firſt onſet, and might have gained a complete victory had he thought proper to purſue them. After this, ſeveral towns ſubmitted to him; but the ſeaſon being now far ſpent, the emperor returned to Conſtantinople. The following year he paſſed over into Aſia early in the ſpring; and being informed that the Turks had ſacked the rich city of Iconium, beſides gaining other conſiderable advantages, he marched in perſon againſt them.

126
They are again defeated.

But the Turks, not thinking it adviſable to wait his coming, retired in great haſte. The Armenians, however, encouraged by the approach of the emperor's army, fell upon the enemy in the plains of Tarſus, put them to flight, and ſtripped them both of their baggage and the booty they had taken. The ſpring following the emperor once more entered Aſia at the head of a conſiderable army which he had raiſed, and with incredible pains diſciplined during the winter. When the two armies drew near to each other, Axan, the Turkiſh ſultan, and ſon of the famous Tangrolipix, ſent propoſals to Romanus for a laſting and honourable peace.

127
The Romans defeated and the emperor taken.

Theſe were imprudently rejected, and a deſperate engagement enſued, when, in ſpite of the utmoſt efforts of the emperor, his army was routed, and he himſelf wounded and taken priſoner. When this news was brought to Axan, he could ſcarcely believe it; but being convinced by the appearance of the royal captive in his preſence, he tenderly embraced him, and addreſſed him in an affectionate manner: "Grieve not (ſaid he), moſt noble emperor, at your misfortune; for ſuch is the chance of war, ſometimes overwhelming one, and ſometimes another; you ſhall have no occaſion to complain of your captivity; for I will not uſe you as my priſoner, but as an emperor." The Turk was as good as his word. He lodged the emperor in a royal pavilion; aſſigned him attendants with an equipage ſuitable to his quality; and diſcharged ſuch priſoners as he deſired. After he had for ſome days entertained his royal captive with extraordinary magnificence, a perpetual peace was concluded betwixt them, and the emperor diſmiſſed with the greateſt marks of honour imaginable.

128
Eudocia depoſed and confined in a monaſtery.

He then ſet out with the Turkiſh ambaſſador for Conſtantinople, where the peace was to be ratified; but by the way he was informed that Eudocia had been driven from the throne by John the brother of Conſtantine Ducas, and Pſellus a leading man in the ſenate, who had confined her to a monaſtery, and proclaimed her eldeſt ſon, Michael Ducas, emperor. On this intelligence, Romanus retired to a ſtrong caſtle near Theodoſiopolis, where he hoped in a ſhort time to be joined by great numbers of his friends and adherents. But in the mean time John, who had taken upon him to act as guardian to the young prince, deſpatched Andronicus with a conſiderable army againſt him. Andronicus having eaſily defeated the ſmall army which Romanus had with him, obliged him to fly to Adana a city in Cilicia, where he was cloſely beſieged, and at laſt obliged to ſurrender. Andronicus carried his priſoner into Phrygia, where he fell dangerouſly ill, being, as was ſuſpected, ſecretly poiſoned.

120
Romanus put to death.

But the poiſon being too ſlow in its operation, John ordered his eyes to be put out; which was done with ſuch cruelty that he died ſoon after, in the year 1067, having reigned three years and eight months.

130
The Turks again invade the empire.

Axan was no ſooner informed of the tragical end of his friend and ally, than he reſolved to invade the

131 They defeat the Romans.

132 They gain a ſecond victory.

empire anew; and that not with a deſign only to plunder as formerly, but to conquer, and keep what he had once conquered. The emperor diſpatched againſt him Iſaac Comnenus, with a conſiderable army; but he was utterly defeated and taken priſoner by Axan. Another army was quickly ſent off under the command of John Ducas the emperor's uncle. He gained at firſt ſome advantages, and would probably have put a ſtop to their conqueſts, had not one Ruſelius, or Urſelius, revolted with the troops he had under his command, cauſed himſelf to be proclaimed emperor, and reduced ſeveral cities in Phrygia and Cappadocia. Againſt him John marched with all his forces, ſuffering the Turks in the mean time to purſue their conqueſts; but coming to an engagement with the rebels, his army was entirely defeated and himſelf taken priſoner. Notwithſtanding this victory, Ruſelius was ſo much alarmed at the progreſs of the Turks, that he not only releaſed his priſoner, but joined with him againſt the common enemy, by whom they were both defeated and taken priſoners. Axan, however, was for ſome time prevented from purſuing his conqueſt by Cutlu-Moſes, nephew to the late Tangrolipix. He had revolted againſt his uncle; but being defeated by him in a pitched battle, had taken refuge in Arabia, whence he now returned at the head of a conſiderable army in order to diſpute the ſovereignty with Axan. But while the two armies were preparing to engage, the caliph of Babylon, who was ſtill looked upon as the ſucceſſor of the great prophet, interpoſed his authority. He repreſented the dangers of their inteſtine diſſenſions; and by his mediation, an agreement was at laſt concluded, on condition that Axan ſhould enjoy undiſturbed the monarchy lately left him by his father, and Cutlu-Moſes ſhould poſſeſs ſuch provinces of the Roman empire as he or his ſons ſhould in proceſs of time conquer.

133 They conquer ſeveral provinces.

After this agreement, both the Turkiſh princes turned their forces againſt the empire; and before the year 1077, made themſelves maſters of all Media, Lycaonia, Cappadocia, and Bithynia, fixing the capital city of their empire at Nice in the latter province. During all this time, the emperors of Conſtantinople, as well as their ſubjects, ſeemed to be in a manner infatuated. No notice was taken of the great progreſs made by theſe barbarians. The generals were ambitious only of ſeizing the tottering empire, which ſeemed ready to fall a prey to the Turks; and, after it was obtained, ſpent their time in oppreſſing their ſubjects, rather than in making any attempts to repulſe the enemy.

134 Alexius Comnenus ſtops their progreſs.

At laſt Alexius Comnenus, having wreſted the empire from Nicephorus Botoniates, in 1077, began to prepare for oppoſing ſo formidable an enemy. But before he ſet out, as his ſoldiers had committed great outrages on his acceſſion to the empire, he reſolved to make confeſſion of his ſins, and do open penance for thoſe he had ſuffered his army to commit. Accordingly he appeared in the attire of a penitent before the patriarch and ſeveral other eccleſiaſtics, acknowledged himſelf guilty of the many diſorders that had been committed by his ſoldiers, and begged of the patriarch to impoſe upon him a penance ſuitable to the greatneſs of his crimes. The penance enjoined him and his adherents by the patriarch was to faſt, lie upon the ground, and practiſe ſeveral other auſterities for the ſpace of 40 days. This command was religiouſly obeyed, and the emperor then began to prepare for war with ſo much vigour, that Solyman, the Turkiſh ſultan, ſon and ſucceſſor to Cutlu-Moſes, diſpatched ambaſſadors to Alexius with propoſals of peace. Theſe were at firſt rejected; but the emperor was at laſt glad to accept them, on certain advice that Robert Guiſchard, duke of Puglia and Calabria, was making great preparations againſt him in the weſt.

135 Robert Guiſchard's expedition againſt the emperor.

136 He paſſes over into Epirus and beſieges Dyrrhachium.

To this expedition Robert was incited by Michael Ducas. That prince had been depoſed by Nicephorus Botoniates, and towards the end of the uſurper's reign fled into the weſt, where he was received by Robert, who was prevailed upon to favour his cauſe. For this purpoſe, Robert made great preparations; and theſe were continued even after the depoſition of Botoniates. He ſailed with all his forces from Brunduſium; and landing at Buthrotum in Epirus, made himſelf maſter of that place, while his ſon Bohemond with part of the army reduced Aulon, a celebrated port and city in the country now called *Albania*. From thence they advanced to Dyrrhachium, which they inveſted both by ſea and land; but met with a moſt vigorous oppoſition from George Paleologus, whom the emperor had entruſted with the defence of that important place. In ſpite of the utmoſt efforts of the enemy, this commander held out till the arrival of the Venetian fleet, by whom Robert's navy, commanded by Bohemond, was utterly defeated, the admiral himſelf having narrowly eſcaped being taken priſoner. After this victory, the Venetians landed without loſs of time, and being joined by Paleologus's men, fell upon Robert's troops with ſuch fury, that they deſtroyed their works, burnt their engines, and forced them back to their camp in great diſorder. As the Venetians were now maſters at ſea, the beſieged were ſupplied with plenty of proviſions, while a famine began to rage in the camp of the enemy; and this calamity was ſoon followed by a plague, which in the ſpace of three months is ſaid to have deſtroyed ten thouſand men. Notwithſtanding all theſe diſaſters, however, Robert did not abandon the ſiege: having found means to ſupply his famiſhed troops with proviſions, he continued it with ſuch vigour, that the courage of the beſieged began at laſt to fail them; and Paleologus ſent repeated meſſages to the emperor, acquainting him that he would be obliged to ſurrender unleſs very ſpeedily aſſiſted. On this Alexius marched in perſon to the relief of the city, but was defeated with great loſs by Robert. The whole right wing of Alexius's army, finding themſelves hard preſſed by the enemy, fled to a church dedicated to St Michael, imagining they would there find themſelves in a place of ſafety; but the victorious army purſuing them, ſet fire to the church, which was burnt to aſhes with all who were in it. The emperor himſelf with great difficulty made his eſcape, leaving the enemy maſters of his camp and all his baggage. Soon after this defeat, the city ſurrendered; and Alexius being deſtitute of reſources for carrying on the war, ſeized on the wealth of churches, and monaſteries, which gave much offence to the clergy, and had like to have occaſioned great diſturbances in the imperial city. At the ſame time, Alexius entering into an alliance with Henry emperor of Germany, perſuaded

137
The city ſurrenders.

138
The war ended by the death of Robert.

perſuaded him to invade the dominions of Robert in Italy. At firſt Henry met with great ſucceſs; but was ſoon overcome, and driven out of that country by Robert. Bohemond, in the mean time, reduced ſeveral places in Illyricum; and, having defeated Alexius in two pitched battles, entered Theſſaly, and ſat down before Lariſſa. This place, being defended by an officer of great courage and experience in war, held out till the emperor came to its relief. Soon after his arrival, he found means to draw a ſtrong party of Bohemond's men into an ambuſcade, and cut them off almoſt entirely. However, in the battle which was fought a few days after, Bohemond had the advantage; but his troops mutinying and refuſing to carry on the war, he was obliged to return to Italy. Alexius taking advantage of his abſence, recovered ſeveral cities; and being informed that Robert was making great preparations againſt him, he had recourſe once more to the Venetians. By them he was aſſiſted with a powerful fleet, which defeated that of Robert in two engagements; but being ſoon after ſurpriſed by him, they were defeated with the loſs of almoſt their whole navy. Robert is ſaid to have uſed his victory with great barbarity, putting many of his priſoners to death with unheard-of torments. The Venetians equipped a ſecond fleet; and joining that of the emperor, fell unexpectedly upon Robert's navy, who were riding without the leaſt apprehenſions in Buthrotum, ſunk moſt of his ſhips, and took a great number of priſoners, his wife and younger ſons having narrowly eſcaped falling into their hands. Robert made great preparations to revenge this defeat; but was prevented by death from executing his deſigns; and, after his deceaſe, his ſon Roger did not think proper to purſue ſo dangerous and expenſive a war. He therefore recalled his troops, and the places which had been conquered by Robert and Bohemond ſubmitted anew to the emperor.

139
The Scythian war.

140
The Romans defeated.

141
They at laſt defeat the Scythians.

This war was ſcarce ended, when the Scythians paſſing the Danube laid waſte great part of Thrace, committing everywhere the greateſt barbarities. Againſt them the emperor diſpatched an army under the command of Pacurianus and Branas. The latter inſiſted upon engaging the enemy, contrary to the opinion of his colleague; and his raſhneſs cauſed the loſs of the greater part of the army, who were cut off by the Scythians, together with the two generals. *Taticius*, an officer who had ſignalized himſelf on many occaſions, was appointed to command the army in their room. He fell upon the enemy as they lay ſecurely in the neighbourhood of Philippopolis, cut great numbers of them in pieces, and obliged the reſt to retire in great confuſion. The following ſpring, however, they returned in ſuch numbers, that the emperor reſolved to march againſt them in perſon. Accordingly he ſet out for Adrianople, and from thence to a place called *Lardea*. Here, contrary to the advice of his beſt officers, he ventured a battle; in which he was utterly defeated with the loſs of vaſt numbers of his men, he himſelf eſcaping with the utmoſt difficulty. The next year he was attended with no better ſucceſs, his army being entirely defeated with the loſs of his camp and baggage. In the year follwing, 1084, the emperor retrieved his credit; and gave the Scythians ſuch an overthrow, that very few eſcaped the general ſlaughter. Notwithſtanding this diſaſter, however, they again invaded the empire in 1093. To this they were encouraged by an impoſtor called *Leo*, who pretended to be the eldeſt ſon of Romanus Diogenes. The young prince had been ſlain in a battle with the Turks; but as the Scythians only wanted a pretence to renew the war, they received the impoſtor with joy. By a ſtratagem, however, Leo was murdered; and the Scythians being afterwards overthrown in two great battles, were obliged to ſubmit on the emperor's own terms.

142
The Holy War.

143
Dreadful fire at Conſtantinople.

144
Murtzuphlus ſtrangles the emperor.

Since the year 1083, the war had been carried on with the Turks with various ſucceſs; but now an aſſociation was formed in the weſt againſt theſe infidels, which threatened the utter ruin of the Turkiſh nation. This was occaſioned by the ſuperſtition of the Chriſtians, who thought it a meritorious action to venture their lives for the recovery of the Holy Land, poſſeſſed at that time by the Turks and Saracens. Had the weſtern princes been properly aſſiſted by the emperors of the Eaſt in this undertaking, the Turks had undoubtedly been unable to reſiſt them; but ſo far from this, the Latins were looked upon by them as no leſs enemies than the Turks; and indeed whatever places they took from the infidels, they never thought of reſtoring to the emperors of Conſtantinople, to whom they originally belonged, but erected a number of ſmall independent principalities; which neither having ſufficient ſtrength to defend themſelves, nor being properly ſupported by one another, ſoon became a prey to the Turks. In the year 1203 happened a dreadful fire at Conſtantinople, occaſioned by ſome Latin ſoldiers. Theſe had plundered a moſque, which the Turks reſiding in Conſtantinople had been ſuffered to build there. For this reaſon they were attacked by the infidels; who being much ſuperior to them in number, the Latins found themſelves obliged to ſet fire to ſome houſes, in order to make their eſcape with ſafety. The flame ſpreading in an inſtant from ſtreet to ſtreet, reduced in a ſhort time great part of the city to aſhes, with the capacious ſtore-houſes which had been built at a vaſt expence on the quay. The late emperor Iſaac Angelus who had been reſtored to his throne by the Latins, died ſoon after their departure from Conſtantinople, leaving his ſon Alexius ſole maſter of the empire. The young prince, to diſcharge the large ſums he had promiſed the French and Venetians for their aſſiſtance, was obliged to lay heavy taxes on his ſubjects; and this, with the great eſteem and friendſhip ſhowed to his deliverers, raiſed a general diſcontent among the people of Conſtantinople, who were ſworn enemies to the Latins. This encouraged John Ducas, ſurnamed *Murtzuphlus*, from his joined and thick eyebrows, to attempt the ſovereignty. Unhappily he found means to put his treacherous deſigns in execution; and ſtrangled the young prince with his own hands. After this he preſented himſelf to the people; told them what he had done, which he pretended was in order to ſecure their liberties; and earneſtly intreated them to chooſe an emperor who had courage enough to defend them againſt the Latins that were ready to oppreſs and enſlave them. On this he was inſtantly ſaluted emperor by the inconſtant multitude; but this uſurpation proved the ruin of the city. The Latins immediately reſolved to revenge

Conſtantinopolitan hiſtory.

the death of the young prince; and, as they had been ſo often betrayed and retarded in their expeditions to the Holy Land by the emperors of Conſtantinople, to make themſelves maſters of that city, and ſeize the empire for themſelves. In conſequence of this reſolution they muſtered all their forces in Aſia, and having croſſed the ſtraits, laid ſiege to Conſtantinople by ſea and land. The tyrant, who was a man of great courage and experience in war, made a vigorous defence. The Latins, however, after having battered the walls for ſeveral days together with an incredible number of engines, gave a general aſſault on the 8th of April 1204. The attack laſted from break of day till three in the afternoon, when they were forced to retire, after having loſt ſome of their engines, and a great number of men. The aſſault was nevertheleſs renewed four days after; when, after a warm diſpute, the French planted their ſtandard on one of the towers; which the Venetians obſerving, they quickly made themſelves maſters of four other towers, where they likewiſe diſplayed their enſigns. In the mean time three of the gates being broken down by the battering rams, and thoſe who had ſcaled the walls having killed the guards, and opened the gates between the towers they had taken, the whole army entered, and drew up in battle array between the walls. The Greeks fled up and down in the greateſt confuſion; and ſeveral parties were by the Latins diſpatched to ſcour the ſtreets, who put all they met to the ſword, without diſtinction of age or condition. Night put a ſtop to the dreadful ſlaughter, when the princes ſounding the retreat, placed their men in different quarters of the city, with orders to be upon their guard, not doubting but they ſhould be attacked early next morning. They were ſurpriſed, however, at that time by the entire ſubmiſſion of the Greeks; to whom they promiſed their lives, but at the ſame time ordering them to retire to their houſes, they gave up the city to be plundered by the ſoldiers for that day. They ſtrictly enjoined their men to abſtain from ſlaughter, to preſerve the honour of the women, and to bring the whole booty into one place, that a juſt diſtribution might be made according to the rank and merit of each individual. The Greeks had undoubtedly concealed their moſt valuable effects during the night; many perſons of the firſt rank had eſcaped, and carried along with them immenſe treaſures; the ſoldiers had probably, as is uſual in all ſuch caſes, reſerved things of great value for themſelves, notwithſtanding all prohibitions to the contrary; and yet the booty, without the ſtatues, pictures, and jewels, amounted to a ſum almoſt incredible. As for Murtzuphlus, he made his eſcape in the night; embarking in a ſmall veſſel with *Euphroſyne*, the wife of *Alexius Angelus* a late uſurper, and her daughter *Eudoxia*, for whoſe ſake he had abandoned his lawful wife.

145
The city taken and plundered by the Latins.

146
The Latins expelled.

Conſtantinople continued ſubject to the Latins till the year 1261, when they were expelled by one *Alexius Strategopulus*. He was a perſon of an illuſtrious family; and, for his eminent ſervices, diſtinguiſhed with the title of *Cæſar*. He had been ſent againſt Alexius Angelus deſpot of Epirus, who now attempted to recover ſome places in Theſſaly and Greece from Michael Paleologus, one of the Greek emperors, that ſince the capture of Conſtantinople, had kept their court at Nice; and to try whether he could on his march ſurpriſe the imperial city itſelf. Alexius, having paſſed the ſtraits, encamped at a place called *Rhegium*, where he was informed by the natives that a ſtrong body of the Latins had been ſent to the ſiege of *Daphnuſa*, that the garriſon was in great want of proviſions, and that it would be no difficult matter to ſurpriſe the city. Hereupon the Greek general reſolved at all events to attempt it: in which he was encouraged by ſome of the inhabitants, who, coming privately to his camp, offered themſelves to be his guides. He approached the walls in the dead of the night, which ſome of his men ſcaled without being obſerved; and, killing the centries, whom they found aſleep, opened one of the gates to the reſt of the army. The Greeks ruſhing in, put all they met to the ſword; and at the ſame time, to create more terror, ſet fire to the city in four different places. The Latins, concluding from thence that the enemy's forces were far more numerous than they really were, did not ſo much as attempt either to drive them out or to extinguiſh the flames. In this general confuſion, the emperor Baldwin, quitting the enſigns of majeſty, fled with Juſtinian the Latin patriarch, and ſome of his intimate friends, to the ſea-ſide; and there, embarking in a ſmall veſſel, ſailed firſt to Eubœa, and afterwards to Venice, leaving the Greeks in full poſſeſſion of Conſtantinople. When news of this ſurpriſing and altogether unexpected ſucceſs of Alexius were firſt brought to Paleologus, he could ſcarce give credit to it; but receiving ſoon after letters from Alexius himſelf, with a particular account of ſo memorable an event, he ordered public thanks to be returned in all the churches, appeared in public in his imperial robes, attended by the nobility in their beſt apparel, and ordered couriers to be diſpatched with the agreeable news into all parts of the empire.

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147
Entry of Michael Paleologus into the city.

Soon after, having ſettled his affairs at Nice, he ſet out for Conſtantinople with the empreſs, his ſon Andronicus, the ſenate, and nobility, to take poſſeſſion of the imperial city, and fix his reſidence in that place that had originally been deſigned for the ſeat of the eaſtern empire. Having paſſed the ſtraits, he advanced to the *golden gate*, and continued ſome days without the walls, while the citizens were buſied in making the neceſſary preparations to receive him with a magnificence ſuitable to the occaſion. On the day appointed, the golden gate, which had been long ſhut up, was opened, and the emperor entering it amidſt the repeated acclamations of the multitude, marched on foot to the great palace. He was preceded by the biſhop of *Cyzicus*, who carried an image of the Virgin Mary, ſuppoſed to have been done by St Luke, and followed by all the great officers, nobility, and chief citizens, pompouſly dreſſed. Public thanks were again returned in the church of St Sophia, at which the emperor aſſiſted in perſon, with the clergy, the ſenate, and nobility. Theſe exerciſes were ſucceeded by all ſorts of rejoicings; after which the emperor carefully ſurveyed the imperial city. This ſurvey greatly allayed his joy. He ſaw the ſtately palaces and other magnificent buildings of the Roman emperors lying in ruins; the many capacious buildings that had been erected by his predeceſſors, at an immenſe charge, deſtroyed by fire, and other unavoidable accidents of war;

148
He reſolves to reſtore it to its former grandeur.

war; ſeveral ſtreets abandoned by the inhabitants, and choaked up with rubbiſh, &c. Theſe objects gave the emperor no ſmall concern, and kindled in him a deſire of reſtoring the city to its former luſtre. In the mean time, looking upon Alexius as the reſtorer of his country, he cauſed him to be clad in magnificent robes; placed with his own hand a crown on his head; ordered him to be conducted through the city, as it were in triumph; decreed that for a whole year the name of Alexius ſhould be joined in the public prayers with his own; and to perpetuate the memory of ſo great and glorious an action, he commanded his ſtatue to be erected on a ſtately pillar of marble before the church of the Apoſtles. His next care was to re-people the city, many Greek families having withdrawn from it while it was held by the Latins, and the Latins now preparing to return to their reſpective countries. The former were recalled home; and the latter, in regard of the great trade they carried on, were allowed many valuable privileges, which induced them not to remove. The Greeks were allowed to live in one of the moſt beautiful quarters of the city, to be governed by their own laws and magiſtrates, and to trade without paying cuſtoms or taxes of any kind. Great privileges were likewiſe granted to the natives of Venice and Piſa, which encouraged them to lay aſide all thoughts of removing; and the trade they carried on proved afterwards highly advantageous to the ſtate.

It was not long, however, before theſe regulations were altered. The emperor being ſoon after informed that Baldwin, lately expelled from Conſtantinople, had married his daughter to Charles king of Sicily, and given him, by way of dowry, the imperial city itſelf, he ordered the Genoeſe, who were become very numerous, to remove firſt to Heraclia, and afterwards to Galata, where they continued. As for the Piſans and Venetians, who were not ſo numerous and wealthy, they were allowed to continue in the city. Paleologus, though he had cauſed himſelf to be proclaimed emperor, and was poſſeſſed of abſolute ſovereignty, was as yet only guardian to the young emperor John Laſcaris, then about 12 years of age. But having now ſettled the ſtate, and having gained the affections both of natives and foreigners, he began to think of ſecuring himſelf and his poſterity in the full enjoyment of the empire; and for this reaſon cruelly ordered the eyes of the young prince to be put out, pretending that none but himſelf had any right to the city or empire of Conſtantinople, which he alone had recovered out of the hands of the Latins.

149
Great diſturbances occaſioned by the treachery of Paleologus.

This piece of treachery and inhumanity involved him in great troubles. The patriarch immediately excommunicated him; and he would in all probability have been driven from the throne by a combination of the weſtern princes, had he not engaged Pope Urban IV. to eſpouſe his cauſe, by promiſing to ſubmit himſelf and his dominions to the Latin church. Thus, indeed, he diverted the preſent ſtorm; but this proceeding cauſed the greateſt diſturbances, not only in Conſtantinople, but throughout the whole empire, nor was Paleologus able to reconcile his ſubjects to this union.

150
Union of the Greek and Latin churches.

151
Diſſolved.

In 1283 Michael died, and was ſucceeded by his ſon Andronicus. His firſt ſtep was to reſtore the ancient Greek ceremonies, thinking he could not begin his reign with a more popular act. But thus he involved himſelf in difficulties ſtill greater than before. Though Michael had not been able fully to reconcile his Greek ſubjects to the Latin ceremonies, yet he had in ſome degree accompliſhed his purpoſe. The Latins had got a conſiderable footing in the city, and defended their ceremonies with great obſtinacy; ſo that the empire was again thrown into a ferment by this imprudent ſtep.

152
War with the Turks.

All this time the Turks had been continuing their encroachments on the empire, which, had it not been for the cruſades publiſhed againſt them by the pope, they would in all probability have made themſelves maſters of before this time. They were now, however, very ſucceſsfully oppoſed by Conſtantine the emperor's brother: but his valour rendered him ſuſpected by the emperor; in conſequence of which he was thrown into priſon, along with ſeveral perſons of great diſtinction. On the removal of this brave commander, the Turks, under the famous Othoman, made themſelves maſters of ſeveral places in Phrygia, Caria, and Bithynia; and, among the reſt, of the city of Nice. To put a ſtop to their conqueſts, the emperor diſpatched againſt them Philanthropenus and Libadarius, two officers of great experience in war. The former gained ſome advantages over the enemy; but being elated with his ſucceſs, cauſed himſelf to be proclaimed emperor. This rebellion, however, was ſoon ſuppreſſed, Philanthropenus being betrayed by his own men; but the Turks taking advantage of theſe inteſtine commotions, not only extended their dominions in Aſia, but conquered moſt of the iſlands in the Mediterranean; and, being maſters at ſea, infeſted the coaſts of the empire, to the utter ruin of trade and commerce.

From this time the Roman empire tended faſt to diſſolution. After the revolt of Philanthropenus, the emperor could no longer truſt his ſubjects, and therefore hired the Maſſagetes to aſſiſt him: but they, behaving in a careleſs manner, were firſt defeated by their enemies, and afterwards turned their arms againſt thoſe they came to aſſiſt. He next applied to the Catalans, who behaved in the ſame manner; and having ravaged the few places left the emperor in Aſia, returned into Europe, and called the Turks to their aſſiſtance.

153
Their firſt appearance in Europe.

This happened in the year 1292, and was the firſt appearance of the Turks in Europe. This enterpriſe, however, was unſucceſsful. Having loaded themſelves with booty, they offered to depart quietly if they were allowed a ſafe paſſage, and ſhips to tranſport them to Aſia. To this the emperor, willing to get rid of ſuch troubleſome gueſts, readily conſented, and ordered the veſſels to be got ready with all poſſible expedition. But the Greek officers obſerving the immenſe booty with which they were loaded, reſolved to fall upon them in the night, and cut them all off at once. This ſcheme, however, was not managed with ſuch ſecrecy but that the Turks had notice of it, and therefore prepared for their defence. They firſt ſurpriſed a ſtrong caſtle in the neighbourhood, and then found means to acquaint their countrymen in Aſia with their dangerous ſituation. Their brethren, enticed with the hopes of booty, were not long in coming to their aſſiſtance; and having croſſed the Helleſpont in great numbers, ravaged the adjacent country, making excurſions to the very gates of Conſtantinople. At laſt the emperor determined to root them out; and accordingly marched againſt them with all his forces, the country people flocking to him from all quarters. The Turks at firſt gave themſelves over for loſt; but finding the Greeks negligent of diſcipline, they attacked their army unexpectedly, utterly defeated it, and made themſelves maſters of the camp. After this unexpected victory, they continued for two years to ravage Thrace in the moſt terrible manner. At laſt, however, they were defeated; and being afterwards ſhut up in the Cherſoneſus, they were all cut in pieces or taken.

154 They are all cut in pieces or taken.

Soon after new commotions took place in this unhappy empire, of which the Turks did not fail to take the advantage. In 1327 they made themſelves maſters of moſt of the cities on the Mæander; and, among the reſt, of the ſtrong and important city of Pruſa in Bithynia. The next year, however, Othoman, who may juſtly be ſtyled the founder of the Turkiſh monarchy, being dead, the emperor laid hold of that opportunity to recover Nice, and ſome other important places, from the infidels. But theſe were loſt the year following, together with Abydus and Nicomedia; and in 1330 a peace was concluded upon condition that they ſhould keep all their conqueſts. This peace they obſerved no longer than ſerved their own purpoſes; for new commotions breaking out in the empire, they purſued their conqueſts, and by the year 1357 had reduced all Aſia. They next paſſed the Helleſpont under the conduct of Solyman the ſon, or, as others will have it, the brother of Orchane, the ſucceſſor of Othoman, and ſeized on a ſtrong caſtle on the European ſide. Soon after the Turkiſh ſultan died, and was ſucceeded by Amurath. He extended the conqueſts of his predeceſſors, and in a ſhort time reduced all Thrace, making Adrianople the ſeat of his empire. Amurath was ſlain by treachery in a little time after, and was ſucceeded by his ſon Bajazet. This prince greatly enlarged his dominions by new conqueſts. In a ſhort time he reduced the countries of Theſſaly, Macedon, Phocis, Peloponneſus, Myſia, and Bulgaria, driving out the deſpots or petty princes who ruled there. Elated with his frequent victories, he began to look upon the Greek emperor, to whom nothing was now left but the city of Conſtantinople and the neighbouring country, as his vaſſal. Accordingly he ſent him an arrogant and haughty meſſage, commanding him to pay a yearly tribute, and ſend his ſon Manuel to attend him in his military expeditions. This demand the emperor was obliged to comply with, but died ſoon after, in the year 1392.

155 Adrianople taken by the Turks.

Manuel no ſooner heard of his father's death than he haſtened to Conſtantinople, without taking leave of the ſultan, or acquainting him with the reaſon of his ſudden departure. At this Bajazet was ſo highly offended, that he paſſed with great expedition out of Bithynia into Thrace, ravaged the country adjoining to Conſtantinople, and at laſt inveſted the city itſelf both by ſea and land. In this extremity Manuel had recourſe to the weſtern princes; who ſent him an army of 130,000 men, under the command of Sigiſmund king of Hungary, and John count of Nevers. But though the weſtern troops proved at firſt ſucceſsful, they were in the end defeated with great ſlaughter by Bajazet, who then returned to the ſiege with greater vigour than ever. As he found, however, that the citizens were determined to hold out to the laſt, he applied to John, the ſon of Manuel's elder brother, who had a better title to the crown than Manuel himſelf. With him he entered into a private agreement, by virtue of which Bajazet was to place John upon the throne of Conſtantinople; on the other hand, John was to deliver up the city to the Turks, and remove the imperial city to Peloponneſus, which the ſultan promiſed to relinquiſh to him and his poſterity. At the ſame time, he ſent deputies to the inhabitants of Conſtantinople, offering to withdraw his army, and ceaſe from further hoſtilities, provided they expelled Manuel and placed John upon the throne. This propoſal rent the city into two factions; but Manuel prevented the miſchiefs which were ready to enſue, by a voluntary reſignation, upon condition that he ſhould be allowed to retire to whatever place he thought proper with his wife and children.

156 Bajazet beſieges Conſtantinople.

With this condition John readily complied; and Manuel having received him into the city, and conducted him to the palace, ſet ſail for Venice. From thence he went to the courts of all the weſtern princes, to ſolicit their aſſiſtance againſt the Turks, whoſe power was grown formidable to all Europe. He was everywhere received with the greateſt demonſtrations of eſteem, and promiſed large ſupplies; all Chriſtendom being now alarmed at the progreſs of the infidels.

In the mean time, Bajazet did not fail to put John in mind of his promiſe; but the citizens refuſing to comply with ſuch a ſcandalous treaty, the ſiege was renewed, and the city aſſaulted with more fury than ever. When it was already reduced to the laſt extremity, news were brought the ſultan that Tamerlane, the victorious Tartar, having overrun all the eaſt with incredible celerity, had now turned his arms againſt the Turks, and was preparing to break into Syria. Bajazet, alarmed at the danger that threatened him, raiſed the ſiege in great haſte, and advanced againſt Tamerlane with a very numerous and well-diſciplined army; but the Tartar totally defeated and took him priſoner, after having cut moſt of his men in pieces: and thus Conſtantinople was preſerved for the preſent.

157 He is defeated and taken priſoner by Tamerlane

But this relief was of ſhort duration. In 1424 the city was again beſieged by Amurath II. The inhabitants defended themſelves with great bravery; but muſt in the end have ſubmitted, had not the emperor prevailed upon the prince of Caramania to countenance an impoſtor and pretender to the Turkiſh throne. This obliged Amurath to raiſe the ſiege, and march with all his forces againſt the uſurper, whom he ſoon reduced. Having then no other enemies to contend with, he entered Macedon at the head of a powerful army; and having ravaged the country far and near, he took and plundered Theſſalonica, as he did alſo moſt of the cities of Ætolia, Phocis, and Bœotia. From Greece he marched into Servia; which country he ſoon reduced. He next broke into the dominions of the king of Hungary, and beſieged the ſtrong city of Belgrade; but here he met with a vigorous repulſe, no fewer than 15,000 Turks being ſlain by the Chriſtians in one ſally, which obliged the ſultan to drop the enterpriſe and retire.

158 Amurath beſieges Conſtantinople.

159 The ſiege raiſed.

160 Succeſs of John Hunniades againſt the Turks.

161 He is at laſt defeated.

In his retreat he was attacked by the celebrated John Hunniades, who cut great numbers of his men in pieces, and obliged the reſt to fly with precipitation. Not long after he gained a ſtill more complete victory over the enemy in the plains of Tranſylvania, with the loſs of only 3000 of his own men, whereas 20,000 of the Turks were killed on the field of battle, and almoſt an equal number in the purſuit. Amurath, who was then at Adrianople, ſent an army into Tranſylvania far more numerous than the former; but they were attended with no better ſucceſs, being cut off almoſt to a man by the brave Hungarian. He gained ſeveral other victories no leſs remarkable; but was at laſt entirely defeated in 1448; and with this defeat ended all hopes of preſerving the Roman empire. The unhappy emperor was now obliged to pay an annual tribute of 300,000 aſpers to the ſultan; and to yield up to him ſome ſtrong holds which he ſtill held on the Euxine ſea. However, as he doubted not but Amurath would ſoon attempt to become maſter of the city itſelf, he renewed the union between the Greek and Latin churches, hoping that this would induce the weſtern princes to aſſiſt him in the defence of the city againſt the Turks. This union produced great diſturbances, which the emperor did not long ſurvive, but died in 1448, leaving the empire, now confined within the walls of Conſtantinople, to his brother Conſtantine.

162 Conſtantinople beſieged by Mohammed.

Amurath the Turkiſh ſultan died in 1450, and was ſucceeded by his ſon Mohammed. In the beginning of his reign he entered into an alliance with Conſtantine, and pretended a great deſire to live in friendſhip with him and the other Chriſtian princes; but no ſooner had he put an end to a war in which he was engaged with Ibrahim king of Caramania, than he built a ſtrong fort on the European ſide of the Boſphorus, oppoſite to another in Aſia; in both of which he placed ſtrong garriſons. Theſe two caſtles commanded the ſtraits; and the former being but five miles from the city, kept it in a manner blocked up. This ſoon produced a miſunderſtanding between him and the emperor, which ended in the ſiege of the city. The ſiege commenced on the ſixth of April 1453, Mohammed's numerous forces covering the plains before it on the land-ſide, and a fleet of 300 ſail blocking it up by ſea. The emperor, however, had taken care to ſecure the haven, in which were three large ſhips, 20 ſmall ones, and a great number of galleys, by means of a chain drawn acroſs the entrance. Mohammed began the ſiege by planting batteries as near the city as he could, and raiſing mounts in ſeveral places as high as the walls themſelves, whence the beſieged were inceſſantly galled with ſhowers of arrows. He had in his camp a piece of ordnance of prodigious ſize, which is ſaid to have carried a ball of 100 pounds weight made of hard black ſtone brought from the Euxine ſea. With this vaſt piece the enemy made ſeveral breaches in the walls; which, however, were repaired with incredible expedition by the beſieged. But Mohammed, the better to carry on the ſiege, cauſed new levies to be made through his extenſive dominions, by which his army was ſoon increaſed to near 400,000 men; while the garriſon conſiſted only of 9000 regular troops, viz. 6000 Greeks and 3000 Genoeſe and Venetians. As the enemy continued to batter the walls day and night without intermiſſion, a great part of them was at laſt beaten down; but while the Turks were buſy in filling up the ditch, in order to give the aſſault, a new wall was built. This threw the tyrant into a prodigious rage, which was greatly heightened when he ſaw his whole fleet worſted by five ſhips, four of which were laden with corn from Peloponneſus, and the other with all manner of proviſions from the iſle of Chios. Theſe opened themſelves a way through the whole Turkiſh fleet; and, to the inexpreſſible joy of the Chriſtians, at laſt got ſafe into the harbour.

163 He conveys 80 galleys over land into the haven.

The Turks attempted ſeveral times to force the haven; but all their efforts proving ineffectual, Mohammed formed a deſign of conveying 80 galleys over land for the ſpace of eight miles into it. This he accompliſhed by means of certain engines, the contrivance of a renegado; and having then either taken or ſunk all the ſhips contained in it, he cauſed a bridge to be built over it with ſurpriſing expedition. By this means the city was laid open to an aſſault from that ſide likewiſe. The place was now aſſaulted on all ſides; and Conſtantine being well appriſed that he could not long hold out againſt ſuch a mighty fleet and ſo numerous an army, ſent deputies to Mohammed offering to acknowledge himſelf his vaſſal, by paying him yearly what tribute he ſhould think proper to impoſe, provided he raiſed the ſiege and withdrew. The tyrant anſwered that he was determined at all events to become maſter of the city: but if the emperor delivered it up forthwith, he would yield up to him Peloponneſus, and other provinces to his brothers, which they ſhould enjoy peaceably as his friends and allies: but if he held out to the laſt extremity, and ſuffered it to be taken by aſſault, he would put him and the whole nobility to the ſword, abandon the city to be plundered by his ſoldiers, and carry the inhabitants into captivity.

164 A mutiny in the Turkiſh camp.

This condition was raſhly rejected by the emperor; who thereby involved himſelf and all his ſubjects in the moſt terrible calamity. The ſiege was renewed with more vigour than ever, and continued till the 25th of May; when a report being ſpread in the Turkiſh camp that a mighty army was advancing in full march to the relief of the city under the conduct of the celebrated John Hunniades, the common ſoldiers, ſeized with a panic, began to mutiny, and preſs Mohammed in a tumultuous manner to break up the ſiege. Nay, they openly threatened him with death, if he did not immediately abandon the enterpriſe and retire from before the city, which they deſpaired of being able to reduce before the arrival of the ſuppoſed ſuccours. Mohammed was upon the point of complying with their demand, when he was adviſed by Zagan, a Turkiſh officer of great intrepidity, and an irreconcileable enemy to the Chriſtian name, to give without loſs of time a general aſſault. To this he ſaid the ſoldiery, however mutinous, would not be averſe, provided the ſultan ſolemnly promiſed to abandon the city to be plundered by them. As ſuch an advice beſt ſuited the humour of Mohammed, he readily embraced it; and cauſed a proclamation to be publiſhed throughout the camp, declaring, that he gave up to his ſoldiers all the wealth of that opulent city, requiring to himſelf only the empty houſes.

The deſire of plunder ſoon got the better of that fear which had ſeized the Turkiſh army; and they unanimouſly deſired to be led on to the attack. Hereupon Conſtantine was ſummoned for the laſt time to deliver up the city, with a promiſe of his life and liberty; but to this he anſwered, that he was unalterably determined either to defend the city or to periſh with it.

165
A general aſſault given.

The attack began at three in the morning on Tueſday the 29th of May; ſuch troops were firſt employed as the ſultan valued leaſt, and deſigned them for no other purpoſe than to tire the Chriſtians, who made a prodigious havock of that diſorderly multitude. After the carnage had laſted ſome hours, the Janizaries and other freſh troops advanced in good order, and renewed the attack with incredible vigour. The Chriſtians, ſummoning all their courage and reſolution, twice repulſed the enemy: but being in the end quite ſpent, they were no longer able to ſtand their ground; ſo that the enemy in ſeveral places broke into the city. In the mean time Juſtiniani, the commander of the Genoeſe and a ſelect body of Greeks, having received two wounds, one in the thigh and the other in the hand, was ſo diſheartened, that he cauſed himſelf to be conveyed to Galata, where he ſoon after died of grief. His men, diſmayed at the ſudden flight of their general, immediately quitted their poſts and fled in the utmoſt confuſion.

166
Bravery of the emperor.

However, the emperor, attended with a few of the moſt reſolute among the nobility, ſtill kept his poſt, ſtriving with unparalleled reſolution to oppoſe the multitude of barbarians that now broke in from every quarter. But being in the end overpowered with numbers, and ſeeing all his friends lie dead on the ground, "What! (cried he aloud) is there no Chriſtian left alive to ſtrike off my head?"

167
He is killed.

He had ſcarce uttered theſe words, when one of the enemy, not knowing him, gave him a deep cut acroſs the face with his ſabre; and at the ſame time, another coming behind him, with a blow on the back part of his head laid him dead on the ground.

168
The town plundered, and the inhabitants maſſacred.

After the death of the emperor, the few Chriſtians that were left alive betook themſelves to flight; and the Turks, meeting with no further oppoſition, entered the city, which they filled with blood and ſlaughter. They gave no quarter, but put all they met to the ſword, without diſtinction. Many thouſands took refuge in the church of St Sophia, but they were all maſſacred in their aſylum by the enraged barbarians; who, prompted by their natural cruelty, the deſire of revenge, and love of booty, ſpared no place nor perſon. Moſt of the nobility were, by the ſultan's orders, cut off, and the reſt kept for purpoſes more grievous than death itſelf. Many of the inhabitants, among whom were ſome men of great learning, found means to make their eſcape while the Turks were buſied in plundering the city. Theſe embarking on five ſhips then in the harbour, arrived ſafe in Italy; where, with the ſtudy of the Greek tongue, they revived the liberal ſciences, which had long been neglected in the weſt. After the expiration of three days, Mohammed commanded his ſoldiers to forbear all further hoſtilities on pain of death: and then put an end to as cruel a pillage and maſſacre as any mentioned in hiſtory. The next day he made his public and triumphal entry into Conſtantinople, and choſe it for the ſeat of the Turkiſh empire, which it has continued to be ever ſince.

169
Preſent ſtate of the city.

This city is now called by the Turks *Iſtampol*, and by the Greeks *Iſtampoli* or *Stampoli*. It is ſeated at the eaſtern extremity of Romania, on a ſmall neck of land which advances towards Natolia, from which it is ſeparated by a channel of a mile in breadth. The ſea of Marmora waſhes its walls on the ſouth, and a gulf of the channel of Conſtantinople does the ſame on the north. It is delightfully ſituated between the Black ſea and the Archipelago, from whence it is ſupplied with all neceſſaries. The grand ſeignior's palace, called the *Seraglio*, is ſeated on the ſea-ſide, and is ſurrounded with walls flanked with towers, and ſeparated from the city by canals. It is ſaid the harbour will eaſily hold 1200 ſhips. The number of houſes muſt needs be prodigious, ſince one fire has burnt down 30,000 in a day, without greatly changing the aſpect of the city. However, in general, they are but mean, eſpecially on the outſide, where there are few or no windows; and the ſtreets being narrow, gives them a melancholy look. They reckon that there are 3770 ſtreets, ſmall and great; but they are ſeldom or never clean; and the people are infeſted with the plague almoſt every year. The inhabitants are half Turks, two-thirds of the other half Chriſtians, and the reſt Jews. Here are a great number of ancient monuments ſtill remaining, and particularly the ſuperb temple of Sophia, which is turned into a moſque, and far ſurpaſſes all the reſt. The ſtreet called *Adrianople* is the longeſt and broadeſt in the city; and the bazars, or beſteins, are the markets for ſelling all ſorts of merchandiſe. The old and the new are pretty near each other; and are large ſquare buildings, covered with domes, and ſupported by arches and pilaſters. The new is the beſt, and contains all ſorts of goods which are there expoſed to ſale. The market for ſlaves, of both ſexes, is not far off; and the Jews are the principal merchants, who bring them here to be ſold. There are a great number of young girls brought from Hungary, Greece, Candia, Ruſſia, Mingrelia, and Georgia, for the ſervice of the Turks, who generally buy them for their ſeraglios. The great ſquare, near the moſque of Sultan Bajazet, is the place for public diverſions, where the jugglers and mountebanks play a great variety of tricks. The circumference of this city is by ſome ſaid to be 15 miles, and by Mr Tournefort 23 miles; to which if we add the ſuburbs, it may be 34 miles in compaſs. The ſuburb called *Pera* is charmingly ſituated; and is the place where the ambaſſadors of England, France, Venice, and Holland, reſide. This city is built in the form of a triangle; and as the ground riſes gradually, there is a view of the whole town from the ſea. The public buildings, ſuch as the palaces, the moſques, bagnios, and caravanſaries for the entertainment of ſtrangers, are many of them very magnificent. E. Long. 29. 20. N. Lat. 41. 4.

CONSTAT, in *Law*, the name of a certificate which the clerk of the pipe and auditors of the exchequer make at the requeſt of any perſon who intends to plead or move in that court for the diſcharge of any thing; and the effect of it is, the certifying what does *conſtare* upon record touching the matter in queſtion.

—A

—A conſtat is held to be ſuperior to a certificate; becauſe this may err or fail in its contents; that cannot, as certifying nothing but what is evident upon record.

Alſo the exemplification under the great ſeal of the inrolment of any letters patent is called a *conſtat*.

CONSTELLATION, in *Aſtronomy*, a ſyſtem of ſeveral ſtars that are ſeen in the heavens near to one another. Aſtronomers not only mark out the ſtars, but, that they may better bring them into order, they diſtinguiſh them by their ſituation and poſition in reſpect to each other; and therefore they diſtribute them into aſteriſms or conſtellations, allowing ſeveral ſtars to make up one conſtellation: and for the better diſtinguiſhing and obſerving them, they reduce the conſtellations to the forms of animals, as men, bulls, bears, &c.; or to the images of ſome things known, as of a crown, a harp, a balance, &c.; or give them the names of thoſe whoſe memories, in conſideration of ſome notable exploit, they had a mind to tranſmit to future ages.

The diviſion of the ſtars by images and figures is of great antiquity, and ſeems to be as old as aſtronomy itſelf: for in the moſt ancient book of Job, Orion, Arcturus, and the Pleiades, are mentioned; and we meet with the names of many of the conſtellations in the writings of the firſt poets, Homer and Heſiod.

The ancients, in their diviſion of the firmament, took in only ſo much as came under their notice, diſtributing it into 48 conſtellations; but the modern aſtronomers comprehend the whole ſtarry firmament, dividing it into three regions. See ASTRONOMY *Index*.

CONSTERNATION is defined by ethical writers to be an exceſs of horror, owing to the ill government of our admiration and fear: or ſuch an immoderate degree of fear as confounds the faculties, and incapacitates a perſon for conſultation and execution.

CONSTIPATION, in *Medicine*, a hardneſs of the belly, with great coſtiveneſs. See COSTIVENESS.

CONSTITUENT PART, in *Phyſiology*, an eſſential part in the compoſition of any thing, differing little from what is otherwiſe called *element* or *principle*.

CONSTITUTION, in matters of policy, ſignifies the form of government eſtabliſhed in any country or kingdom.

CONSTITUTION alſo denotes an ordinance, deciſion, regulation, or law, made by authority of any ſuperior, eccleſiaſtical or civil.

Apoſtolical CONSTITUTIONS, a collection of regulations attributed to the Apoſtles, and ſuppoſed to have been collected by St Clement, whoſe name they likewiſe bear.

It is the general opinion, however, that they are ſpurious, and that St Clement had no hand in them. They appeared firſt in the 4th age, but have been much changed and corrupted ſince that time. They are divided into eight books, conſiſting of a great number of rules and precepts, relating to the duties of Chriſtians, and particularly the ceremonies and diſcipline of the church. Mr Whiſton, in oppoſition to the general opinion, aſſerts them to be a part of the ſacred writings, dictated by the Apoſtles in their meetings, and written down from their own mouth by St Clement; and intended as a ſupplement to the New Teſtament, or rather as a ſyſtem of Chriſtian faith and polity. The reaſon why the Conſtitutions are ſuſpected by the orthodox, and perhaps the reaſon alſo why their genuineneſs is defended by Mr Whiſton, is, that they ſeem to favour Arianiſm.

CONSTITUTION, in a phyſical ſenſe, ſignifies the particular temperature of the body.

It is curious to obſerve, ſays Dr Percival, the revolution which hath taken place, within this century, in the conſtitutions of the inhabitants of Europe. Inflammatory diſeaſes more rarely occur, and, in general, are much leſs rapid and violent in their progreſs than formerly (A); nor do they admit of the ſame antiphlogiſtic method of cure that was practiſed with ſucceſs 100 years ago. The experienced Sydenham makes 40 ounces of blood the mean quantity to be drawn in the acute rheumatiſm; whereas this diſeaſe, as it now appears in the London hoſpitals, will not bear above half that evacuation. Vernal intermittents are frequently cured by a vomit and the bark, without veneſection; which is a proof that at preſent they are accompanied with fewer ſymptoms of inflammation than they were wont to be. This advantageous change, however, is more than counterbalanced by the introduction of a numerous claſs of nervous ailments, in a great meaſure unknown to our anceſtors; but which now prevail univerſally, and are complicated with almoſt every other diſtemper. The bodies of men are enfeebled and enervated; and it is not uncommon to obſerve very high degrees of irritability, under the external appearance of great ſtrength and robuſtneſs. The hypochondria, palſies, cachexies, dropſies, and all thoſe diſeaſes which ariſe from laxity and debility, are in our days endemic everywhere; and the hyſterics, which uſed to be peculiar to the women, as the name itſelf indicates, now attack both ſexes indiſcriminately. It is evident that ſo great a revolution could not be effected without a concurrence of many cauſes; but amongſt theſe (according to Dr Percival), the preſent general uſe of tea * holds the firſt and principal rank. The ſecond place may perhaps be allowed to exceſs in ſpirituous liquors. This pernicious cuſtom, in many inſtances at leaſt, owes its riſe to the former, which, by the lowneſs and depreſſion of ſpirits it occaſions, renders it almoſt neceſſary to have recourſe to ſomething cordial and exhilarating. And hence proceed thoſe odious and diſgraceful habits of intemperance, with which many of the ſofter ſex are now, alas! chargeable.

* See *Tea*.

CONSTRICTOR, an appellation given to ſeveral muſcles,

(A) The decreaſe in the violence of inflammatory diſeaſes may perhaps in part be aſcribed to the preſent improved method of treating them. Moderate evacuations, cool air, aceſcent diet, and the liberal uſe of ſaline and antimonial medicines, are better adapted to check the progreſs of fevers, than copious bleedings, ſtimulating purgatives, and profuſe ſweats excited by theriaca and mithridate.

muſcles, on account of their conſtringing or cloſing ſome of the orifices of the body.

CONSTRUCTION, in *Geometry*, is the drawing ſuch lines, ſuch a figure, &c. as are previouſly neceſſary for making any demonſtration appear more plain and undeniable.

Construction of Equations. See EQUATIONS.

CONSTRUCTION, in *Grammar;* ſyntax, or the arranging and connecting the words of a ſentence according to the rules of the language. See GRAMMAR and LANGUAGE.

The conſtruction is generally more ſimple, eaſy, and direct, in the modern tongues than in the ancient: we have very few of thoſe inverſions which occaſion ſo much embarraſſment and obſcurity in the Latin; our thoughts are uſually delivered in the ſame order wherein the imagination conceives them: the nominative caſe, for inſtance, always precedes the verb, and the verb goes before the oblique caſes it governs.

The Greeks and Latins, M. St Evremont obſerves, uſually end their periods, where, in good ſenſe and reaſon, they ſhould have begun; and the elegance of their language conſiſts, in ſome meaſure, in this capricious arrangement, or rather in this tranſpoſal and diſorder of the words. See LANGUAGE.

Construction of Statutes, among lawyers. See LAW *Index*.

CONSUALIA, in antiquity, feaſts which were held among the ancients, in honour of the god Conſus i. e. Neptune; different from thoſe other feaſts of the ſame deity called *Neptunalia*. They were introduced with a magnificent cavalcade, or proceſſion on horſeback; becauſe Neptune was reputed to have firſt taught men the uſe of horſes; whence his ſurname of Ἵππιος, *Equeſtris*.

Evander is ſaid to have firſt inſtituted this feaſt: it was re-eſtabliſhed by Romulus, under the name of *Conſus;* becauſe it was ſome god under the denomination of Conſus that ſuggeſted to him the rape of the Sabines. It is ſaid, that it was with a view to this rape that he made that eſtabliſhment. This, however, is certain, that it was to this feaſt all his neighbours were invited; when, taking advantage of the ſolemnities and ſacrifices, he ſeized the women. To draw the greater concourſe of people, he gave out, that he had found an altar hid under ground, which he intended to conſecrate, with ſacrifices to the god to whom it had been originally erected. Thoſe who take upon them to explain the myſteries of the heathen theology, ſay, that the altar hid under ground is a ſymbol of the ſecret deſign of Romulus to ſeize his neighbours wives.

The conſualia were of the number of feaſts called ſacred; as being conſecrated to a divinity.—Originally they were not diſtinguiſhed from thoſe of the circus; whence it is, that Valerius Maximus ſays, that the rape of the Sabines was effected at the games of the circus.

Plutarch obſerves, that during the days of this ſolemnity, horſes and aſſes were left at reſt, and were dreſſed up with crowns, &c. on account of its being the feaſt of Neptunus Equeſtris. Feſtus ſays, the cavalcade was performed with mules; it being an opinion, that this was the firſt animal uſed to draw the car. Servius gives us to underſtand, that the conſualia fell on the 13th of Auguſt; Plutarch, in the life of Romulus, placed them on the 18th, and the old Roman kalendar on the 21ſt of that month.

CONSUBSTANTIAL, in *Theology*, a term of like import with co-eſſential; denoting ſomething of the ſame ſubſtance with another. The orthodox believe the Son of God to be conſubſtantial with the Father.

The term ὁμοουσιος, *conſubſtantial*, was firſt adopted by the fathers of the councils of Antioch and Nice, to expreſs the orthodox doctrine the more preciſely, and to ſerve as a barrier and precaution againſt the errors and ſubtleties of the Arians; who owned every thing excepting the conſubſtantiality.

The Arians allowed, that the Word was God, as having been made God; but they denied that he was the ſame God, and of the ſame ſubſtance with the Father: accordingly they exerted themſelves to the utmoſt to aboliſh the uſe of the word. The emperor Conſtantine uſed all his authority with the biſhops to have it expunged out of the ſymbols; but it ſtill maintained itſelf, and is at this day, as it was then, the diſtinguiſhing criterion between an Athanaſian and an Arian.

Sandius will have it, that the word conſubſtantial was unknown till the time of the council of Nice; but it is certain it had been before propoſed to the council of Antioch, wherein Paulus Samoſatenus had been condemned; though it had there the fortune to be rejected. Curcellæus, on the other hand, maintains that it was an innovation in doctrine in the council of Nice, to admit an expreſſion, the uſe whereof had been aboliſhed by the council of Antioch.

According to St Athanaſius, the word conſubſtantial was only condemned in the council of Antioch, inaſmuch as it implied the idea of a pre-exiſtent matter, prior to the things formed thereof; now, in this ſenſe, it is certain, the Father and the Son are not conſubſtantial, there having been no pre-exiſtent matter.

CONSUBSTANTIATION, a tenet of the Lutheran church with regard to the manner of the change made in the bread and wine in the euchariſt. The divines of that profeſſion maintain, that after conſecration, the body and blood of our Saviour are ſubſtantially preſent, together with the ſubſtance of the bread and wine, which is called *conſubſtantiation*, or *impanation*.

CONSUL, the chief magiſtrate of the Roman commonwealth, inveſted with regal authority for the ſpace of one year. They were two in number, called conſuls *à conſulendo*, and annually choſen in the Campus Martius. The two firſt conſuls were L. Jun. Brutus, and L. Tarquinius Collatinus, choſen in the year of Rome 244, after the expulſion of the Tarquins. In the firſt times of the republic the two conſuls were always choſen from patrician families or noblemen, but the people obtained the privilege in the year of Rome 388, of electing one of the conſuls from their own body, and ſometimes both were plebeians. The firſt conſul among the plebeians was L. Sextius. It was required that every candidate for the conſulſhip ſhould be 43 years of age, called *legitimum tempus*. He was always to appear at the election as a private man without a retinue, and it was requiſite before he canvaſſed for the office to have diſcharged the functions of quæſtor, edile, and prætor. Sometimes theſe qualifications were diſregarded. Val. Corvinus was made a conſul in his 23d year, and Scipio in his 24th. Young Marius, Pompey, and Auguſtus, were alſo under the proper age, when they were inveſted with the office, and Pompey had never been quæſtor or prætor. The power of the conſuls was unbounded, and they knew no ſuperior but the gods and the laws; but after the expiration of their office their conduct was minutely ſcrutinized by the people, and miſbehaviour was often puniſhed by the laws. The badge of their office was the *prætexta*, a robe fringed with purple, afterwards exchanged for the *toga picta* or *palmata*. They were preceded by 12 lictors carrying the *faſces* or bundles of ſticks, in the middle of which appeared an axe. The axe, as being the characteriſtic rather of tyranny than of freedom, was taken away from the *faſces* by Valerius Poplicola, but it was reſtored by his ſucceſſor. They took it by turns monthly to be preceded by the lictors while at Rome, leſt the appearance of two perſons with the badges of royal authority ſhould raiſe apprehenſions in the multitude. While one appeared publicly in ſtate, only a crier walked before the other, and the lictors followed behind without the faſces. Their authority was equal; yet the Valerian law gave the right of priority to the older, and the Julian law to him who had moſt children; and he was generally called *conſul major* or *prior*. As their power was abſolute, they preſided over the ſenate, and could convene and diſmiſs it at pleaſure. The ſenators were their counſellors; and among the Romans the manner of reckoning their years was by the name of the conſuls, and by *M. Tull. Cicerone et L. Antonio Conſulibus*, for inſtance, the year of Rome 689 was always underſtood. This cuſtom laſted from the year of Rome 244 till 1294, or the 541ſt year of the Chriſtian era. In public aſſemblies the conſuls ſat in ivory chairs, and held in their hand an ivory wand called *ſcipio eburneus*, which had an eagle on its top as a ſign of dignity and power. When they had drawn by lot the provinces over which they were to preſide during their conſulſhip, they went to the capitol to offer their prayers to the gods, and intreat them to protect the republic; after this they departed from the city arrayed in their military dreſs and preceded by the lictors. Sometimes the provinces were aſſigned them without drawing by lot, by the will and appointment of the ſenators. At their departure they were provided by the ſtate with whatever was requiſite during their expedition. In their provinces they were both attended by the 12 lictors, and equally inveſted with regal authority. They were not permitted to return to Rome without the ſpecial command of the ſenate; and they always remained in the province till the arrival of their ſucceſſor. At their return they harangued the people, and ſolemnly proteſted that they had done nothing againſt the laws or intereſt of their country, but had faithfully and diligently endeavoured to promote the greatneſs and welfare of the ſtate. No man could be conſul two following years; yet this inſtitution was ſometimes broken, and we find Marius re-elected conſul after the expiration of his office during the Cimbrian war. The office of conſul, ſo dignified during the times of the commonwealth, became a mere title under the emperors, and retained nothing of its authority but the uſeleſs enſigns of original dignity. Even the duration of the office, which was originally annual, was reduced to two or three months by Julius Cæſar; but they who were admitted on the firſt of January denominated the year, and were called *ordinarii*. Their ſucceſſors during the year were diſtinguiſhed by the name of *ſuffecti*. Tiberius and Claudius abridged the time of the conſulſhip; and the emperor Commodus made no leſs than 25 conſuls in one year. Conſtantine the Great renewed the original inſtitution, and permitted them to be a whole year in office.

Conſul, at preſent, is an officer eſtabliſhed by virtue of a commiſſion from the king and other princes, in all foreign countries of any conſiderable trade, to facilitate and diſpatch buſineſs, and protect the merchants of the nation. The conſuls are to keep up a correſpondence with the miniſters of England reſiding in the courts whereon their conſulate depends. They are to ſupport the commerce and the intereſt of the nation; to diſpoſe of the ſums given and the preſents made to the lords and principals of places, to obtain their protection, and prevent the inſults of the natives on the merchants of the nation.

CONSUMMATION, the end, period, or completion of any work. Thus, we ſay, the *conſummation* of all things, meaning the end of the world. By the incarnation, all the prophecies are ſaid to be *conſummated*. See PROPHECY and ACCOMPLISHMENT.

Consummation of Marriage, denotes the laſt act of marriage, which makes its accompliſhment; or the moſt intimate union between the married pair, &c.

CONSUMPTION, in *Medicine*, a word of very extenſive ſignification, implies all diſorders that bring any decay or waſte upon the conſtitution; but is moſt commonly uſed for the *phthiſis pulmonalis*. See MEDICINE *Index*.

Conſumption, in *Farriery*. See FARRIERY *Index*.

CONSUS, the pagan god of counſel. He had an altar under ground in the great circus at Rome, to ſhow that counſel ought to be kept ſecret. See CONSUALIA.

CONTACT, is when one line, plane, or body, is made to touch another; and the parts that do thus touch are called the *points* or *places of contact*.

CONTAGION, in *Phyſic*, the communicating a diſeaſe from one body to another. In ſome diſeaſes it is only effected by an immediate contact or touch, as in ſyphilis; in others it is conveyed by infected clothes; and in others it is ſuppoſed to be tranſmitted through the air at a conſiderable diſtance, by means of ſteams or effluvia ariſing from the ſick, as in the plague and other peſtilential diſorders, in which caſe the air is ſaid to be contagious, though this has been diſputed.

No attempts which have yet been made to inveſtigate the nature of contagion, or to aſcertain the properties of contagious matter, have proved ſucceſsful. But from the means which have been effectually employed either to abate its virulence or to deſtroy it entirely, this matter may be fairly inferred to be of a chemical nature. We have already detailed the effects of the fumes of muriatic acid in purifying the cathedral of Dijon, which were ſucceſsfully uſed by Morveau in

1773. Purſuing this hint, no doubt, Dr Carmichael Smyth propoſed the fumes of nitric acid. This was tried on board different ſhips at Sheerneſs about the year 1796; and being found to anſwer the purpoſe of deſtroying the contagion which then prevailed, Dr Smyth afterwards received a liberal reward from government for his diſcovery. Theſe experiments were conducted on board the Union hoſpital ſhip by Mr Menzies ſurgeon of the Diſcovery, and Mr Baſſan ſurgeon of the Union. The wards at this time were very much crowded with patients; and of 200 ſick on board, 150 were in different ſtages of a malignant contagious fever, which made a very rapid progreſs, and produced very fatal effects on the attendants and ſhip's company.

The materials and apparatus employed in the proceſs were the following: A quantity of fine ſand, two dozen quart earthen pipkins, as many common tea-cups, ſome long ſlips of glaſs to be uſed as ſpatulas, a quantity of concentrated ſulphuric acid, and a quantity of ſaltpetre (nitrate of potaſh).

The proceſs was conducted in the following manner: 1ſt, All the ports and ſcuttles were ſhut up; the ſand, previouſly heated in iron pots, was ſcooped out into the pipkins with an iron ladle; and in this heated ſand, in each pipkin, a ſmall tea-cup was immerſed, containing about half an ounce of ſulphuric acid, to which, after it had acquired a proper degree of heat, an equal quantity of nitrate of potaſh in powder was gradually added, and the mixture ſtirred with a glaſs ſpatula till the vapour aroſe from it in conſiderable quantity. The pipkins were then carried through the wards by the nurſes and convaleſcents, who kept walking about with them in their hands, occaſionally putting them under the cradles of the ſick, and in every corner where any foul air was ſuſpected to lodge. In this manner they continued fumigating, until the whole ſpace between decks, fore and aft, was filled with the vapour, which appeared like a thick haze.

The vapour at firſt excited coughing among the patients, which gradually ceaſed as it became more generally diffuſed through the wards: part of this effect, however, was to be attributed to the inattention of thoſe who carried the pipkins, in putting them too near the faces of the ſick; which cauſed them to inhale the ſtrong vapour as it immediately iſſued from the cups.

The body-clothes and bed-clothes of the ſick were, as much as poſſible, expoſed to the nitrous vapour during the fumigation; and all the foul linen removed from them was immediately immerſed in a tub of cold water, afterwards carried on deck, rinſed out, and hung up till nearly dry, and then fumigated before it was taken to the waſh-houſe: a precaution extremely neceſſary in every caſe of infectious diſorder. Proper attention was alſo paid to cleanlineſs and ventilation.

Three hours were at firſt found neceſſary to fumigate the ſhip. In about an hour after, the vapour having entirely ſubſided, the ports and ſcuttles were thrown open for the admiſſion of freſh air. It could plainly be perceived that the air of the hoſpital was greatly ſweetened even after this firſt fumigation. The proceſs was repeated again next morning; and the people employed, being now more expert, finiſhed the whole in about an hour's time. In an hour afterwards, the vapour having entirely ſubſided, the freſh air was freely admitted into the hoſpital as before. Fewer pipkins were employed for the evening fumigations than for thoſe of the mornings, as the freſh air could not be admitted ſo freely after the former as the latter.

The pleaſing and immediate effect of the fumigation in deſtroying the offenſive and diſagreeable ſmell, ariſing from ſo many ſick crowded together, was now very perceptible, even to the attendants; the conſequence of which was, that they began to place ſome degree of confidence in its efficacy, and approached the cradles of the infected with leſs dread of being attacked with the diſorder: thus the ſick were better attended, and the duty of the hoſpital was more regularly and more cheerfully performed.

From the 26th of November 1795, when the fumigation was firſt reſorted to, till the 25th of December, not a perſon on board was attacked with the fever, though, in the three months preceding, more than one third of all the people in the ſhip had been ſeized with the diſtemper, and of theſe more than one in four were carried off by it; and the probability is, that the ſickneſs and mortality would have gone on, increaſing in proportion to the diffuſion of the contagion, and to the increaſing deſpondency of the people, who conſidered themſelves as ſo many devoted victims.

The advantage of the fumigation was not felt by the ſhip's company and attendants alone, whom it preſerved from the baneful effects of the fever: the ſick and convaleſcents derived almoſt an equal benefit from it. The ſymptoms of the diſeaſe became milder, and loſt much of their malignant appearance; and the advantage of a pure and ſweet air to convaleſcents muſt be obvious.

Great confidence is always dangerous. It proved ſo on the preſent occaſion. On the 17th of December they imagined themſelves ſo ſecure, that they diſcontinued the cuſtom of fumigating morning and evening, thinking that once a day was ſufficient. On the 25th, one of the nurſes ſuffered a ſlight attack; and on the 26th a marine, who, for a week before, had been in a ſtate of intoxication, was ſeized with the fever, and died. Theſe two accidents gave immediate alarm: they returned again to the practice of fumigating twice a-day; and from that time to the extermination of the diſorder, there was not an inſtance of a perſon ſuffering from contagion on board the ſhip.

The ſucceſs of the experiment was not confined to the Union: the power of the nitrous vapour to deſtroy contagion was equally diſplayed on board ſome Ruſſian ſhips then in the Downs. The ſafety, too, with which it may be employed, in any ſituation, without inconvenience or riſk of fire, is another great recommendation in its favour.

It will not be difficult from this deſcription to employ this kind of fumigation. It is only neceſſary to obſerve, for the ſake of thoſe who may not be verſant in chemical purſuits, that the ingredients ought to be pure, and neither metal veſſels nor rods ſhould be uſed. Any kind of metal getting among the ingredients would cauſe the vapour to be very noxious inſtead of ſalutary. The fumes that riſe ſhould be white; if they are of a red colour, there is reaſon to ſuſpect the purity of the ingredients.

The importance of this diſcovery need not be inſiſted on: it is equally applicable to every ſpecies of putrid contagion, even to the plague itſelf. It ſhould therefore be uſed in all hoſpitals and pariſh workhouſes; and ſhould be conſtantly reſorted to by the proprietors of all large works, on the firſt appearance of infectious diſeaſe among the people employed in them:—indeed, it ſhould be employed even as a preventive in all ſituations where a number of people, from the nature of their buſineſs, are obliged to be crowded together, or where, from local circumſtances, there are reaſons for ſuſpecting that the purity of the air is injured by noxious exhalations or other cauſes. If there be any circumſtances in which its utility may be called in queſtion, it can only be in caſes of inflammatory diſeaſes: for, in ſuch, ſuper-oxygenation has been found hurtful.

CONTEMPLATION, an act of the mind, whereby it applies itſelf to conſider and reflect upon the works of God, nature, &c.

CONTEMPORARY, or COTEMPORARY, a perſon or thing that exiſted in the ſame age with another. Thus, Socrates, Plato, and Ariſtophanes, were contemporaries.

CONTEMPT, in a general ſenſe, the act of deſpiſing, or the ſtate of being deſpiſed.

CONTEMPT, in *Law*, is a diſobedience to the rules and orders of a court, which hath power to puniſh ſuch offence; and as this is ſometimes a greater, and ſometimes a leſſer offence, ſo it is puniſhed with greater or leſs puniſhment, by fine, and ſometimes by impriſonment.

CONTENT, in *Geometry*, the area or quantity of matter or ſpace included in certain bounds.

CONTESSA, a port-town of Turkey in Europe, in the province of Macedonia, ſituated on a bay of the Archipelago, about 200 miles weſt of Conſtantinople. E. Long. 25. 0. N. Lat. 41. 0.

CONTEXT, among divines and critics, that part of Scripture or other writing which lies about the text, before or after it, or both. To take the full and genuine ſenſe of the text, the context ſhould be regarded.

CONTEXTURE, a word frequently uſed in ſpeaking both of the works of nature and art; and denoting the diſpoſition and union of the conſtituent parts with reſpect to one another.

CONTI, a town of Picardy in France, with the title of a principality. It is ſeated on the river Seille; in E. Long. 2. 17. N. Lat. 49. 54.

CONTIGUITY, in *Geometry*, is when the ſurface of one body touches that of another.

CONTIGUOUS, a relative term underſtood of things diſpoſed ſo near each other, that they join their ſurfaces, or touch. The houſes in ancient Rome were not contiguous as ours are, but all inſulated.

CONTINENCE, in *Ethics*, a moral virtue, by which we reſiſt concupiſcence. It ſhould ſeem that there is this diſtinction between chaſtity and continence, in that it requires no effort to be chaſte, which reſults from conſtitution; whereas continence appears to be the conſequence of a victory gained over ourſelves. The verb *continere*, in the Latin, ſignifies "to reſtrain." The term, however, is moſt uſually applied to men; as *chaſtity* is to women. See CHASTITY.

Continence is a virtue that makes but an inconſiderable figure in our days. However, we ought not to loſe our ideas of things, though we have debauched our true reliſh in our practice: for, after all, ſolid virtue will keep its place in the opinion of the wiſe and ſenſible part of mankind. And though cuſtom has not made it ſo ſcandalous as it ought to be to inſnare innocent women, and triumph in the falſehood; ſuch actions as we ſhall relate muſt be accounted true gallantry, and riſe higher in our eſteem the farther they are removed from our imitation.

1. Scipio the younger, when only 24 years of age, was appointed by the Roman republic to the command of the army againſt the Spaniards. His wiſdom and valour would have done honour to the moſt experienced general. Determined to ſtrike an important blow, he forms a deſign of beſieging Carthagena, then the capital of the Carthaginian empire in Spain. His meaſures were ſo judiciouſly concerted, and with ſo much courage and intrepidity purſued, both by ſea and land, that notwithſtanding a bold and vigorous defence, the capital was taken by ſtorm. The plunder was immenſe. Ten thouſand free-men were made priſoners; and above 300 more, of both ſexes, were received as hoſtages. One of the latter, a very ancient lady, the wife of Mandonius, brother of Indibilis king of the Ilergetes, watching her opportunity, came out of the crowd, and throwing herſelf at the conqueror's feet, conjured him, with tears in her eyes, to recommend to thoſe who had the ladies in their keeping to have regard to their ſex and birth. Scipio, who did not underſtand her meaning at firſt, aſſured her that he had given orders that they ſhould not want for any thing. But the lady replied, "Thoſe conveniences are not what affect us. In the condition to which fortune hath reduced us, with what ought we not to be contented! I have many other apprehenſions, when I conſider, on one ſide, the licentiouſneſs of war; and on the other, the youth and beauty of the princeſſes which you ſee here before us; for as to me, my age protects me from all fear in this reſpect." She had with her the daughters of Indibilis, and ſeveral other ladies of high rank, all in the flower of youth, who conſidered her as their mother. Scipio then comprehending what the ſubject of her fear was, "My own glory (ſays he), and that of the Roman people, are concerned in not ſuffering that virtue, which ought always to be reſpected wherever we find it, ſhould be expoſed in my camp to a treatment unworthy of it. But you give me a new motive for being more ſtrict in my care of it, in the virtuous ſolicitude you ſhow in thinking only of the preſervation of your honour, in the midſt of ſo many other objects of fear." After this converſation, he committed the care of the ladies to ſome officers of experienced prudence, ſtrictly commanding that they ſhould treat them with all the reſpect they could pay to the mothers, wives, and daughters, of their allies and particular friends. It was not long before Scipio's integrity and virtue were put to the trial. Being retired in his camp, ſome of his officers brought him a young virgin of ſuch exquiſite beauty, that ſhe drew upon her the eyes and admiration of every body. The young conqueror ſtarted from his ſeat with confuſion and ſurpriſe; and, like one thunderſtruck, ſeemed to be robbed of that preſence of mind and ſelf-poſſeſſion ſo neceſſary in a general, and for which *Livy, Val. Maximus, &c.*

which Scipio was remarkably famous. In a few moments, having rallied his ſtraggling ſpirits, he inquired of the beautiful captive, in the moſt civil and polite manner, concerning her country, birth, and connections; and finding that ſhe was betrothed to a Celtiberian prince named Allucius, he ordered both him and the captive's parents to be ſent for. The Spaniſh prince no ſooner appeared in his preſence, than, even before he ſpake to the father and mother, he took him aſide; and, to remove the anxiety he might be in on account of the young lady, he addreſſed him in theſe words: "You and I are young, which admits of my ſpeaking to you with more liberty. Thoſe who brought me your future ſpouſe, aſſured me, at the ſame time, that you loved her with extreme tenderneſs; and her beauty left me no room to doubt it. Upon which reflecting, that if, like you, I had thought on making an engagement, and were not wholly engroſſed with the affairs of my country, I ſhould deſire that ſo honourable and legitimate a paſſion ſhould find favour, I think myſelf happy in the preſent conjuncture to do you this ſervice. Though the fortune of war has made me your maſter, I deſire to be your friend. Here is your wife: take her, and may the gods bleſs you with her. One thing, however, I would have you be fully aſſured of, that ſhe has been amongſt us as ſhe would have been in the houſe of her father and mother. Far be it from Scipio to purchaſe a looſe and momentary pleaſure at the expence of virtue, honour, and the happineſs of an honeſt man. No; I have kept her for you, in order to make you a preſent worthy of you and of me. The only gratitude I require of you for this ineſtimable gift is, that you would be a friend to the Roman people." Allucius's heart was too full to make him any anſwer; but throwing himſelf at the general's feet, he wept aloud. The captive lady fell into the ſame poſture: and remained ſo, till the father burſt out into the following words: "Oh! divine Scipio! the gods have given you more than human virtue! Oh! glorious leader! Oh! wondrous youth! does not that obliged virgin give you, while ſhe prays to the gods for your proſperity, raptures above all the tranſports you could have reaped from the poſſeſſion of her injured perſon?"

The relations of the young lady had brought with them a very conſiderable ſum for her ranſom: but when they ſaw that ſhe was reſtored to them in ſo generous and godlike a manner, they intreated the conqueror, with great earneſtneſs, to accept that ſum as a preſent; and declared, by his complying, that new favour would complete their joy and gratitude. Scipio, not being able to reſiſt ſuch warm and earneſt ſolicitation, told them that he accepted the gift; and ordered it to be laid at his feet: then addreſſing himſelf to Allucius, "I add (ſays he) to the portion which you are to receive from your father-in-law this ſum; which I deſire you to accept as a marriage-preſent."

If we conſider that Scipio was at this time in the prime of life, unmarried, and under no reſtraint, we cannot but acknowledge, that the conqueſt he made of himſelf was far more glorious than that of the Carthaginian empire: and though his treatment of this captive prince was not more delicate and generous than what might juſtly be expected from a perſon endowed with reaſon and reflection; yet conſidering how few there are in his circumſtances who would have acted as he did, we cannot but applaud his conduct, and propoſe him as a ſuitable example to future ages. Nor was his virtue unrewarded. The young prince, charmed with the liberality and politeneſs of Scipio, went into his country to publiſh the praiſes of ſo generous a victor. He cried out, in the tranſports of his gratitude, "That there was come into Spain a young hero like the gods, who conquered all things leſs by the force of his arms than the charms of his virtue and the greatneſs of his beneficence." Upon this report all Celtiberia ſubmitted to the Romans; and Allucius returned in a ſhort to Scipio, at the head of 1400 choſen horſe, to facilitate his future conqueſts. To render the marks of his gratitude ſtill more durable, Allucius cauſed the action we have juſt related to be engraven on a ſilver ſhield, which he preſented to Scipio, a preſent infinitely more eſtimable and glorious than all his treaſures and triumphs. This buckler, which Scipio carried with him when he returned to Rome, was loſt, in paſſing the Rhone, with part of the baggage. It continued in that river till the year 1665, when ſome fiſhermen found it. It was, before the revolution, in the king of France's cabinet.

2. The circumſtance which raiſes Alexander the Great above many conquerors, and, as it were, above himſelf, is the uſe he made of his victory after the battle of Iſſus. This is the moſt beautiful incident in his life. It is the point of view in which it is his intereſt to be conſidered; and it is impoſſible for him not to appear truly great in that view. By the victory of Iſſus he became poſſeſſed of the whole Perſian empire; not only Syſigambis, Darius's mother, was his captive, but alſo his wife and daughters, princeſſes whoſe beauty was not to be equalled in all Aſia. Alexander, like Scipio, was in the bloom of life, a conqueror, free, and not yet engaged in matrimony: nevertheleſs, his camp was to thoſe princeſſes a ſacred aſylum, or rather a temple, in which their chaſtity was ſecured as under the guard of virtue itſelf; and ſo highly revered, that Darius, in his expiring moments, hearing the kind treatment they had met with, could not help lifting up his dying hands towards heaven, and wiſhing ſucceſs to ſo wiſe and generous a conqueror, who could govern his paſſions at ſo critical a time. Plutarch informs us more particularly, that the princeſſes lived ſo retired in the camp, according to their own deſire, that they were not ſeen by any perſon except their own attendants; nor did any other perſon dare to approach their apartments. After the firſt viſit, which was a reſpectful and ceremonious one, Alexander, to avoid expoſing himſelf to the dangers of human frailty, made a ſolemn reſolution never to viſit Darius's queen any more. He himſelf informs us of this memorable circumſtance, in a letter written by him to Parmenio, in which he commanded him to put to death certain Macedonians who had forced the wives of ſome foreign ſoldiers. In this letter was the following paragraph: "For as to myſelf, it will be found that I neither ſaw nor would ſee the wife of Darius; and did not ſuffer any one to ſpeak of her beauty before me."

Plutarch.

3. Iſocrates informs us, that Nicocles, king of Salamin, gloried in never having known any woman beſides

ſides his wife; and was amazed that all other contracts of civil ſociety ſhould be treated with due regard, whilſt that of marriage, the moſt ſacred and inviolable of obligations, was broken through with impunity; and that men ſhould not bluſh to commit an infidelity with reſpect to their wives, of which, ſhould their wives be guilty, it would throw them into the utmoſt anguiſh and fury.

4. Henry VI. king of England, though unhappy in his family and government, was nevertheleſs poſſeſſed of many virtues. He was ſo remarkable for his chaſtity, that before his marriage he would not allow any lady of a ſuſpicious character and unguarded conduct to frequent the court: and having obſerved one day ſome ladies with their boſoms uncovered, he turned away his eyes from the indecent object, and reprimanded them ſmartly in the ſimple dialect of the times: "Fy, fy (ſaid he), for ſhame; forſooth ye be to blame."

Rapin

5. In the reign of King Charles II. when licentiouſneſs was at its height in Britain, a yeoman of the guards refuſed the miſtreſs of a king. The lady, who was diſſatisfied with her royal lover, had fixed her eyes upon this man, and thought ſhe had no more to do than ſpeak her pleaſure. He got out of her way. He refuſed to underſtand her; and when ſhe preſſed him further, he ſaid, "I am married." The ſtory reached the king, with all its circumſtances; but they who expected an extravagant laugh upon the occaſion were diſappointed. He ſent for the perſon: he found him a gentleman, though reduced to that mean ſtation; and "Odds fiſh, man (ſays he), though I am not honeſt enough to be virtuous myſelf, I value them that are." He gave him an appointment, and reſpected him for life.

6. In many parts the pooreſt people are the moſt virtuous and honeſt in this reſpect. In the Swede's dominion, towards the pole, there is no name for adultery. They thought it an offence man could not commit againſt man; and have no word to expreſs it in their language. The unpoliſhed Lapland peaſant, with theſe thoughts, is, as a human creature, much more reſpectable than the gay Briton, whoſe heart is ſtained with vices, and eſtranged from natural affection; and he is happier. The perfect confidence mutually repoſed between him and the honeſt partner of his breaſt, entails a ſatisfaction even in the loweſt poverty. It gilds the humble hearth, and lights the cabin; their homely meal is a ſacrifice of thanks, and every breath of ſmoke ariſes in incenſe. If hand be laid upon hand, it is ſure affection; and if ſome infant plays about their knees, they look upon him and upon each other with a delight that greatneſs ſeldom knows, becauſe it feels diſtruſt.

CONTINENT, in general, an appellation given to things continued without interruption; in which ſenſe we ſay, *continent fever*, &c.

CONTINENT, in *Geography*, a great extent of land not interrupted by ſeas, in contradiſtinction to iſland and peninſula, &c. See GEOGRAPHY. Sicily is ſaid to have been anciently torn from the continent of Italy; and it is an old tradition, which ſome of our antiquaries ſtill have a regard to, that Britain was formerly a part of the continent of France.

The world is uſually divided into two great continents, the old and the new. Whether there exiſts in the ſouthern hemiſphere another continent, or the whole be only an immenſe watery region, is a queſtion that for near three centuries has engaged the attention of the learned as well as the commercial world, and given riſe to many intereſting voyages and diſcoveries; concerning which, ſee the article *SOUTH-SEA*.

CONTINGENT, ſomething caſual or unuſual.—Hence future contingent denotes a conditional event which may or may not happen, according as circumſtances fall out.

CONTINGENT, is alſo a term of relation for the quota that falls to any perſon upon a diviſion. Thus each prince of Germany in time of war is to furniſh ſo many men, ſo much money, and munition, for his contingent.

CONTINUED, or CONTINUAL, in a general ſenſe, means inceſſant, or proceeding without interruption.

CONTINUED *Fever*, is ſuch a one as ſometimes remits, but never intermits or goes entirely off till its period.

CONTINUED *Baſs*, in *Muſic*, thus called, ſays Rouſſeau, becauſe it is continued through the whole piece. Its principal uſe, beſides that of regulating the harmony, is to ſupport the voice, and preſerve the tone.—They pretend that it was one Ludovico Viana, of whom a treatiſe ſtill remains, who towards the end of the laſt century firſt put the continued baſs in practice.

CONTINUED *Proportion*, in *Arithmetic*, is that where the conſequent of the firſt ratio is the ſame with the antecedent of the ſecond; as 4 : 8 :: 8 : 16; in contradiſtinction to diſcrete proportion.

CONTINUITY, is defined by ſome ſchoolmen the immediate coheſion of parts in the ſame quantum: by others, a mode of body, whereby its extremities become one; and by others, a ſtate of body reſulting from the mutual implication of its parts. There are two kinds of continuity, mathematical and phyſical. The firſt is merely imaginary, ſince it ſuppoſes real or phyſical parts where there are none. The other, or phyſical continuity, is that ſtate of two or more particles, in which their parts are ſo mutually implicated as to conſtitute one uninterrupted quantity or continuum.

CONTINUO, in *Muſic*, ſignifies the thorough baſs, as *baſſo continuo* is the continual or thorough baſs, which is ſometimes marked in muſic-books by the letters B. C.

CONTOBABDITES, a ſect in the ſixth century. Their firſt leader was Severus of Antioch; who was ſucceeded by John the grammarian ſurnamed Philoponus, and one Theodoſius whoſe followers were alſo called *Theodoſians*. Part of them, who were willing to receive a book compoſed by Theodoſius on the Trinity, made a ſeparate body, and were called *Contobabdites*, from ſome place, which Nicephorus does not mention, but which muſt apparently have been the place where they held their aſſemblies. The Contobabdites allowed of no biſhops; which is the only circumſtance given us concerning them.

CONTOR, CONDOR, or CUNDUR, the American

name of a ſpecies of VULTURE. See ORNITHOLOGY *Index*.

CONTORSION, in general, ſignifies the action of twiſting or wreſting a member of the body out of its natural ſituation. Rope-dancers accuſtom themſelves to contorſions of their limbs from their youth, to render the fibres of their articulations lax, and ſupple to all kinds of poſtures.

CONTORSION, in *Medicine*, has many ſignifications. 1. It denotes the iliac paſſion. 2. An incomplete diſlocation, when a bone is in part, but not entirely, forced from its articulation. 3. A diſlocation of the vertebræ of the back ſidewiſe, or a crookedneſs of theſe vertebræ. And, 4. A diſorder of the head, in which it is drawn towards one ſide, either by a ſpaſmodic contraction of the muſcles on the ſame ſide, or a palſy of the antagoniſt muſcles on the other.

CONTORTÆ, the name of the 30th order in Linnæus's Fragments of a natural method, conſiſting of plants which have a ſingle petal which is twiſted or bent to one ſide. This order contains the following genera, viz. echites, cerbera, gardenia, genipa, microcnemum, nerium, periploca, rawolfia, tabernæmontana, vinca, apocynum, aſclepias, comeraria, ceropegia, cynanchum, plumeria, ſtapelia. See BOTANY *Index*.

CONTOUR, in *Painting*, the outline, or that which defines a figure.

A great part of the ſkill of the painter lies in managing the contours well. Contour, with the Italian painters, ſignifies the lineaments of the face.

CONTOURNE, in *Heraldry*, is uſed when a beaſt is repreſented ſtanding or running with its face to the ſiniſter ſide of the eſcutcheon, they being always ſuppoſed to look to the right, if not otherwiſe expreſſed.

CONTOURNIATED, a term among antiquaries applied to medals, the edges of which appear as if turned in a lathe. This ſort of work ſeems to have had its origin in Greece; and to have been deſigned to perpetuate the memories of great men, particularly thoſe who had borne away the prize at the ſolemn games. Such are thoſe remaining of Homer, Solon, Euclid, Pythagoras, Socrates, and ſeveral athletæ.

CONTRA-HARMONICAL *Proportion*, is that relation of three terms, in which the difference of the firſt and ſecond is to the difference of the ſecond and third, as the third is to the firſt. Thus, for inſtance, 3, 5, and 6, are numbers contra-harmonically proportional; for 2 : 1 :: 6 : 3.

CONTRA-Mure, in *Fortification*, is a little wall built before another partition wall, to ſtrengthen it, ſo that it may receive no damage from the adjacent buildings.

CONTRABAND, in *Commerce*, a prohibited commodity or merchandiſe, bought or ſold, imported or exported, in prejudice to the laws and ordinances of a ſtate, or the public prohibitions of the ſovereign. Contraband goods are not only liable to confiſcation themſelves, but alſo ſubject all other allowed merchandiſe found with them in the ſame box, bale, or parcel, together with the horſes, waggons, &c. which conduct them. There are contrabands likewiſe, which, beſides the forfeiture of the goods, are attended with ſeveral penalties and diſabilities.

CONTRACT, in a general ſenſe, a mutual conſent of two or more parties, who voluntarily promiſe and oblige themſelves to do ſomething; pay a certain ſum, or the like. All donations, exchanges, leaſes, &c. are ſo many different contracts.

CONTRACT is particularly uſed, in common law, for an agreement or covenant between two, with a lawful conſideration or cauſe. As, if I ſell my horſe for money; or covenant, in conſideration of 20l. to make you a leaſe of a farm; theſe are good contracts, becauſe there is *quid pro quo*.

Uſurious CONTRACT, is a contract to pay more intereſt for money than the law allows. See USURY.

Thoſe contracts are ſaid to be *null* which the law prohibits the making of; ſuch are all contracts between perſons incapable of contracting, as minors, religious, lunatics, wives without conſent of their huſbands, &c.

CONTRACT is alſo uſed for the inſtrument in writing, which ſerves as a proof of the conſent granted, and the obligation paſſed between the parties.

Among the ancient Romans, contracts, and all voluntary acts, were written, either by the parties themſelves, or by one of the witneſſes, or by a domeſtic ſecretary of one of the parties, whom they called a *notary*, but who was no public perſon as among us.

The contract, when finiſhed, was carried to the magiſtrate, who gave it a public authority by receiving it *inter acta*, into the number of acts under his juriſdiction; giving each of the parties a copy thereof, tranſcribed by his clerks or domeſtic regiſters, and ſealed with his ſeal. Which practice paſſed into France, where it obtained a long time.

CONTRACTILE FORCE, that property or power inherent in certain bodies, whereby, when extended, they are enabled to draw themſelves up again to their former dimenſions.

CONTRACTION, in *Phyſics*, the diminiſhing the extent or dimenſions of a body, or the cauſing its parts to approach nearer to each other; in which ſenſe it ſtands oppoſed to dilatation or expanſion.

CONTRACTION is frequently uſed by anatomical writers, to expreſs the ſhrinking up of a fibre, or an aſſemblage of fibres, when extended.

Convulſions and ſpaſms proceed from a preternatural contraction of the fibres of the muſcles of the part convulſed. On the contrary, paralytic diſorders generally proceed from a too great laxneſs of the fibres of the part affected; or from the want of that degree of contraction neceſſary to perform the natural motion or action of the part. In the firſt, therefore, the animal ſpirits are ſuppoſed to flow, either in too great a quantity, or irregularly; and, in the laſt, the animal ſpirits are either denied a free paſſage into the part affected, or the tenſion of the fibrillæ is ſuppoſed inſufficient to promote the circulation.

CONTRACTION, in *Grammar*, is the reducing of two ſyllables into one, as *can't* for *cannot*, *ſhould'ſt* for *ſhouldeſt*, &c.

CONTRADICTION, a ſpecies of direct oppoſition, wherein one thing is found diametrically oppoſite to another.

CONTRADICTORY PROPOSITIONS, are oppoſites, one of which imports a mere and naked denial of the other.

Seeming contradictories is when the members of a period quite diſagree in appearance and ſound, but perfectly agree and are conſiſtent in ſenſe: thus,

> Cowards die many times before their death:
> The valiant never taſte of death but once.
> *Shakeſpeare.*

CONTRAFISSURE, in *Surgery*, a kind of fracture, or fiſſure, in the cranium, which ſometimes happens on the ſide oppoſite to that which received the blow, or at leaſt at ſome diſtance from it.

CONTRAINDICATION, in *Medicine*, is an indication which forbids that to be done which the main ſcope of a diſeaſe points out.

Suppoſe, e. gr. in the cure of a diſeaſe a vomit were judged proper; if the patient be ſubject to a vomiting of blood, it is a ſufficient contraindication as to its exhibition.

CONTRARIETY, an oppoſition between two things, which imports their being contrary to one another; and conſiſts in this, that one of the terms implies a negation of the other, either mediately or immediately; ſo that contrariety may be ſaid to be the contraſt, or oppoſition of two things, one of which imports the abſence of the other, as love and hatred.

CONTRAST; oppoſition or diſſimilitude of figures, by which one contributes to the viſibility or effect of the others. See RESEMBLANCE.

CONTRAST, in *Painting* and *Sculpture*, expreſſes an oppoſition or difference of poſition, attitude, &c. of two or more figures, contrived to make variety in a painting, &c. as where, in a group of three figures, one is ſhown before, another behind, and another ſidewiſe, they are ſaid to be in contraſt.

The contraſt is not only to be obſerved in the poſition of ſeveral figures, but alſo in that of the ſeveral members of the ſame figures: thus, if the right arm advance fartheſt, the right leg is to be hindermoſt; if the eye be directed one way, the arm to go the contrary way, &c. The contraſt muſt be purſued even in the drapery.

CONTRAST, in *Architecture*, is to avoid the repetition of the ſame thing, in order to pleaſe by variety.

CONTRATE-WHEEL, in watch-work, that next to the crown, the teeth and hoop whereof lie contrary to thoſe of the other wheels, from whence it takes its name. See *WATCH-Making*.

CONTRAVALLATION, or *the Line of CONTRAVALLATION*, in *Fortification*, a trench guarded with a parapet, and uſually cut round about a place by the beſiegers, to ſecure themſelves on that ſide, and to ſtop the ſallies of the garriſon. See FORTIFICATION.

CONTRAVENTION, in *Law*, a man's failing to diſcharge his word, obligation, duty, or the laws or cuſtoms of the place.

CONTRAYERVA. See DORSTENIA, BOTANY *Index*.

CONTRE, in *Heraldry*, an appellation given to ſeveral bearings, on account of their cutting the ſhield contrary and oppoſite ways: thus we meet with contre bend, contre-chevron, contre-pale, &c. when there are two ordinaries of the ſame nature oppoſite to each other, ſo as colour may be oppoſed to metal, and metal to colour.

CONTRIBUTION, the payment of each perſon's quota of the part he is to bear in ſome impoſition, or common expence. See CONTINGENT, &c.—Contributions are either involuntary, as thoſe of taxes and impoſts; or voluntary, as thoſe of expences for carrying on ſome undertaking for the intereſt of the community.

CONTRIBUTIONS, in a military ſenſe, are impoſitions paid by frontier countries to ſecure themſelves from being plundered and ruined by the enemy's army. The peaſants till their ground under the faith of contributions, as ſecurely as in time of profound peace.

CONTRITION, in *Theology*, a ſorrow for our ſins, reſulting from the reflection of having offended God, from the ſole conſideration of his goodneſs, without any regard to the puniſhment due to the treſpaſs, and attended with a ſincere reſolution of forſaking them. The word is derived from the Latin *conterere*, to break or bruiſe.

CONTROL is properly a double regiſter kept of acts, iſſues, &c. of the officers or commiſſioners in the revenue, army, &c. in order to perceive the true ſtate thereof, and to certify the truth, and the due keeping of the acts ſubject to the enregiſterment.

CONTROLLER, an officer appointed to control or overſee the accounts of other officers; and, on occaſion, to certify whether or not things have been controlled.

In Britain we have ſeveral officers of this name; as controller of the king's houſe, controller of the navy, controller of the cuſtoms, controller of the mint, &c.

CONTROLLER of the Hanaper, an officer who attends the lord chancellor daily, in term and in ſeal-time, to take all things ſealed in leathern bags from the clerks of the hanaper, and to mark the number and effect thereof, and enter them in a book, with all the duties belonging to the king and other officers for the ſame, and ſo charge the clerk of the hanaper with them.

CONTROLLER of the Houſehold, the ſecond officer under the lord ſteward. The name of his office comes from the French word *contrerouler*. His office is to control the accounts and reckonings of the Green Cloth, of which board he is always a member. He carries a white ſtaff, and is always one of the privy-council. He has 107l. 17s. 6d. a-year wages, and 1092l. 2s. 6d. board wages.

CONTROLLER of the Pipe, an officer of the exchequer, who makes out a ſummons twice every year, to levy the farms and debts of the pipe. See PIPE and EXCHEQUER.

CONTROLLERS of the Pells, two officers of the exchequer who are the chamberlain's clerks, and keep a control of pell of the receipts and goings out.

CONTUMACY, in *Law*, a refuſal to appear in court when legally ſummoned, or the diſobedience to the rules and orders of a court having power to puniſh ſuch offence.

CONTUSION, in *Medicine* and *Surgery*, any hurt of the body that is inflicted by a blunt inſtrument. See SURGERY.

CONVALESCENCE, in *Medicine*, the inſenſible recovery of health; or that ſtate in which, after the cure of a diſorder, the body which has been reduced, has not yet regained its vigour, but begins to reſume its powers. Proper aliments conduce to the re-eſtabliſhment of the languid faculties; but as the tone of the bowels is weakened, the digeſtive faculty is not equal to its office, which is ſhown by light ſweats over the whole body; and the ſmalleſt exceſs in this reſpect is oftentimes the occaſion of dangerous relapſes. A perſon in this ſtate is like a taper relumined, which the leaſt degree of wind is ſufficient to extinguiſh.

CONVALLARIA, or *Lily of the Valley*, in *Botany*, a genus of plants, belonging to the hexandria claſs; and in the natural method ranking under *Sarmentaceæ*. See BOTANY *Index*.

CONVENARUM URBS, or *Lugdunum*, in *Ancient Geography*, a town of the Convenæ, a people of Gallia Narbonenſis, at the foot of the Pyrenees. Its origin was owing to the Sertorian war, Pompey compelling the robbers of the Pyrenees and fugitive ſlaves to ſettle there, (Pliny). It ſtood near the head of the Garonne. Now St Bertrand, in Gaſcony. E. Long. 30. Lat. 43. 15.

CONVENTICLE, a diminutive of convent; denoting, properly, a cabal, or ſecret aſſembly, of a part of the monks of a convent, to make a brigue or party in the election of an abbot. From the ill uſe of theſe aſſemblies, the word is come into diſrepute; and now ſtands for any miſchievous, ſeditious, or irregular aſſembly. F. Doucine obſerves, the occidentals always eſteemed the fifth general council an unlawful conventicle.

The term conventicle is ſaid, by ſome, to have been firſt applied in England to the ſchools of Wickliff, and has been ſince uſed to ſignify the religious aſſemblies of all in that country who do not conform to the eſtabliſhed doctrines and worſhip of the church of England.

By 22 Car. II. cap. 1. it is enacted, That if any perſons of the age of 16 years, ſubjects of this kingdom, ſhall be preſent at any conventicle, where there are five or more aſſembled, they ſhall be fined 5s. for the firſt offence, and 10s. for the ſecond; and perſons preaching incur a penalty of 20l. Alſo ſuffering a meeting to be held in a houſe, &c. is liable to 20l. penalty. Juſtices of peace have power to enter ſuch houſes, and ſeize perſons aſſembled, &c. And if they neglect their duty, they ſhall forfeit 100l. And if any conſtable, &c. know of ſuch meetings, and do not inform a juſtice of peace, or chief magiſtrate, &c. he ſhall forfeit 5l. But the 1ſt W. and M. cap. 18. ordains, that proteſtant diſſenters ſhall be exempt from penalties: though, if they meet in a houſe with the doors locked, barred, or bolted, ſuch diſſenters ſhall have no benefit from 1 W. and M. Officers of the government, &c. preſent at any conventicle, at which there ſhall be ten perſons, if the royal family be not prayed for in expreſs words, ſhall forfeit 40l. and be diſabled (Stat. 10 Anne. cap. 2.)

CONVENTION, a treaty, contract, or agreement between two or more parties.

CONVENTION is alſo a name given to an extraordinary aſſembly of parliament, or the eſtates of the realm, held without the king's writ. Of this kind was the convention parliament which reſtored Charles II. This parliament met above a month before his return, and ſat full ſeven months after his reſtoration, and enacted ſeveral laws ſtill in force, which were confirmed by ſtat. 13 Car. II. c. 7. and c. 14. Such alſo was the convention of eſtates in 1688, who upon the retreat of King James II. came to a concluſion that he had abdicated the throne, and that the right of ſucceſſion devolved to King William and Queen Mary; whereupon their aſſembly expired as a convention, and was converted into a parliament.

Convention of Eſtates, in Scotland, was partly of the nature of a parliament; but differing in this, that the former could only lay on taxes, while parliament could both impoſe taxes and make laws.

CONVENTUAL, ſomething belonging to a convent or monaſtery. See MONASTERY, and COENOBITE.

CONVENTUAL, is particularly uſed for a religious who actually reſides in a convent; in contradiſtinction to thoſe who are only gueſts, or are entertained there, or are in poſſeſſion of benefices depending on the houſe. See MONK.

CONVENTUS JURIDICI, were courts of juſtice eſtabliſhed in the Roman provinces; with a reſort or extent of juriſdiction, circumſcribed and confined within certain limits of diſtrict, whither all who were of the reſort were to repair for juſtice. The unſeaſonable affectation of changing forms of war into forms of civil courts, proved the ruin of Varus and of three legions in Germany, (Florus). *Conventum agere*, is to hold a court of juſtice.

CONVERGING or *Convergent Lines*, in *Geometry*, are ſuch as continually approach nearer one another, or whoſe diſtances become ſtill leſs and leſs. Theſe are oppoſed to divergent lines, the diſtances of which become continually greater: thoſe lines which converge one way, diverge the other.

Converging Rays, in *Optics*, thoſe rays that, iſſuing from divers points of an object, incline towards another, till at laſt they meet and croſs, and then become diverging rays.

Converging Series, a ſeries of terms or quantities that always decreaſe the farther they proceed, or which tend to a certain magnitude or limit: in oppoſition to diverging ſeries, or ſuch as become continually larger and larger.

CONVERSATION, or DISCOURSE, ſignifies an interlocution between two, or among more perſons; with this diſtinction, that converſation is uſed for any general intercourſe of ſentiments whatever, whereas a diſcourſe means a converſation limited to ſome particular ſubject.

There is no part, perhaps, of ſocial life, which affords more real ſatisfaction than thoſe hours which one paſſes in rational and unreſerved converſation. That converſation, however, may anſwer the ends for which it was deſigned, the parties who are to join in it muſt come together with a determined reſolution to pleaſe, and to be pleaſed.

In the conduct of it, be not eager to interrupt others, or uneaſy at being yourſelf interrupted; ſince you ſpeak either to amuſe or inſtruct the company, or to receive thoſe benefits from it. Give all, therefore, leave to ſpeak in turn. Hear with patience, and anſwer with preciſion. Inattention is ill manners; it ſhows contempt; and contempt is never forgiven.

Trouble not the company with your own private concerns, as you do not love to be troubled with thoſe of others. Yours are as little to them as theirs are to you. You will need no other rule whereby to judge of this matter.

Contrive, but with dexterity and propriety, that each perſon may have an opportunity of diſcourſing on the ſubject with which he is beſt acquainted. He will be pleaſed, and you will be informed. By obſerving this rule, every one has it in his power to aſſiſt in rendering converſation agreeable; ſince, though he may not chooſe, or be qualified, to ſay much himſelf, he can propoſe queſtions to thoſe who are able to anſwer them.

Avoid ſtories, unleſs ſhort, pointed, and quite *a-propos*. He who deals in them, ſays Swift, muſt either have a very large ſtock, or a good memory, or muſt often change his company. Some have a ſet of them ſtrung together like onions; they take poſſeſſion of the converſation by an early introduction of one, and then you muſt have the whole rope; and there is an end of every thing elſe, perhaps, for that meeting, though you may have heard all twenty times before.

Talk often, but not long. The talent of harangueing private company is inſupportable. Senators and barriſters are apt to be guilty of this fault; and members who never harangue in the houſe will often do it out of the houſe. If the majority of the company be naturally ſilent, or cautious, the converſation will flag, unleſs it be often renewed by one among them who can ſtart new ſubjects. Forbear, however, if poſſible, to broach a ſecond before the firſt is out, leſt your ſtock ſhould not laſt, and you ſhould be obliged to come back to the old barrel. There are thoſe who will repeatedly croſs upon and break into the converſation with a freſh topic, till they have touched upon all and exhauſted none. Economy here is neceſſary for moſt people.

Laugh not at your own wit and humour; leave that to the company.

When the converſation is flowing in a ſerious and uſeful channel, never interrupt it by an ill-timed jeſt. The ſtream is ſcattered, and cannot be again collected.

Diſcourſe not in a whiſper, or half-voice, to your next neighbour. It is ill-breeding, and, in ſome degree, a fraud; converſation-ſtock being, as one has well obſerved, a joint and common property.

In reflections on abſent people, go no farther than you would go if they were preſent. "I reſolve (ſays Biſhop Beveridge) never to ſpeak of a man's virtues to his face, nor of his faults behind his back:"—A golden rule! the obſervation of which would, at one ſtroke, baniſh flattery and defamation from the earth.

CONVERSE, in *Mathematics*. One propoſition is called the *converſe* of another, when, after a concluſion is drawn from ſomething ſuppoſed in the converſe propoſition, that concluſion is ſuppoſed; and then, that which in the other was ſuppoſed, is now drawn as a concluſion from it: thus when two ſides of a triangle are equal, the angles under theſe ſides are equal; and, on the converſe, if theſe angles are equal, the two ſides are equal.

CONVERSION, in a moral ſenſe, implies a repentance for a temper and conduct unworthy our nature, and unbecoming our obligations to its Author, and a reſolution to act a wiſer and a better part for the future.

CONVERSION, in *War*, a military motion, whereby the front of a battalion is turned where the flank was, in caſe the battalion is attacked in the flank.

CONVERSION of Equations, the ſame with reduction of equations by multiplication. See ALGEBRA.

CONVERT, a perſon who has undergone a converſion.

CONVERT is chiefly uſed in reſpect of changes from one religion, or religious ſect, to another. Converts with relation to the religion turned to, are denominated *apoſtates* with regard to that they have relinquiſhed.

The Jews formerly converted to Chriſtianity in England, were called *converſos*. Henry III. built them a houſe in London, and allowed them a competent ſubſiſtence for their lives; which houſe was called *domus converſorum*. But the number afterwards increaſing, they grew a burden to the crown; upon which they were diſtributed among the monaſteries: and after the expulſion of the Jews under Edward III. the *domus converſorum* was given for keeping of the rolls.

CONVERTS, in a monaſtic ſenſe, are lay-friars, or brothers, admitted for the ſervice of the houſe; without orders, and not allowed to ſing in the choir. Till the eleventh century, the word was uſed for perſons who embraced the monkiſh life at the age of diſcretion; by which they were diſtinguiſhed from thoſe devoted in their childhood by their parents, called *oblati*. But in the eleventh century, when they began to receive into monaſteries illiterate perſons, incapable of being clerks, and only deſtined for bodily labour, the ſignification of the word was neceſſarily changed. F. Mabillon obſerves, that it was John firſt abbot of Vallombroſa who firſt introduced theſe brother-converts, diſtinguiſhed by their ſtate from the monks of the choir, who were then either clerks or capable of becoming ſo.

CONVEX, an appellation given to the exterior ſurface of gibbous or globular bodies; in oppoſition to the hollow inner ſurface of ſuch bodies, which is called *concave*; thus we ſay, a convex frieze, lens, mirror, ſuperficies, &c.

CONVEXITY, the exterior ſurface of a convex, i. e. gibbous and globular thing; in oppoſition to concavity, or the inner ſurface, which is hollow or depreſſed. See CONCAVE.

The word is of particular import in catoptrics and dioptrics; where it is applied to mirrors and lenſes.

A convex mirror repreſents its images ſmaller than the objects; as a concave one repreſents them larger: a convex mirror reflects the rays from it, diverging; and therefore diſperſes and weakens their effect: as a concave one reflects them converging; ſo as they concur in a point, and have their effect increaſed; and by how much the mirror is a portion of a ſmaller ſphere, by ſo much does it diminiſh the objects, and diſperſe the rays the more. See MIRROR.

A convex lens is either convex on both ſides, called a *convexo-convex;* or it is plain on one ſide and convex on the other, called a *plano-convex;* or concave on one ſide and convex on the other, called a *convexo-concave*, or *concavo-convex*, as the one or the other ſurface prevails, i. e. as this or that is a portion of a ſmaller ſphere. All convex lenſes inflect the rays of light in their paſſage, i. e. ſend them out from their convex ſurface converging, ſo as that they concur in a point or focus. Hence all convex lenſes magnify, i. e. repreſent their images larger than their objects; and this the more as they are portions of ſmaller ſpheres.

CONVEYANCE, in *Law*, a deed or inſtrument that paſſes land, &c. from one perſon to another.

CONVICT, in common law, a perſon that is found guilty of an offence by the verdict of a jury. See the following article.

CONVICTION, in *Law*. When a jury has given a verdict upon trial, finding the priſoner guilty, he is ſaid to be *convicted* of the crime whereof he ſtands indicted. See TRIAL.

When the offender is thus convicted, there are two collateral circumſtances that immediately ariſe. 1. On a conviction in general for any felony, the reaſonable expences of proſecution are by ſtatute 25 Geo. II. c. 36. to be allowed the proſecutor out of the country-ſtock, if he petitions the judge for that purpoſe; and by ſtatute 17 Geo. II. c. 3. poor perſons, bound over to give evidence, are likewiſe entitled to be paid their charges, as well without conviction as with it. 2. On a conviction of larceny in particular, the proſecutor ſhall have reſtitution of his goods by virtue of the ſtatute 21 Hen. VIII. c. 11. For by the common law there was no reſtitution of goods upon an indictment; becauſe it is at the ſuit of the king only; and therefore the party was enforced to bring an appeal of robbery, in order to have his goods again. But, it being conſidered that the party proſecuting the offender by indictment, deſerves to the full as much encouragement as he who proſecutes by appeal, this ſtatute was made, which enacts, that if any perſon be convicted of larceny by the evidence of the party robbed, he ſhall have full reſtitution of his money, goods, and chattels, or the value of them out of the offender's goods, if he has any, by a writ to be granted by the juſtices. And the conſtruction of this act having been in great meaſure conformable to the law of appeals, it has therefore in practice ſuperſeded the uſe of appeals of larceny. For inſtance, as formerly upon appeals, ſo now upon indictments of larceny, this writ of reſtitution ſhall reach the goods ſo ſtolen, notwithſtanding the property of them is endeavoured to be altered by ſale in market overt. And though this may ſeem ſomewhat hard upon the buyer, yet the rule of law is, that *ſpoliatus debet ante omnia reſtitui*, eſpecially when he has uſed all the diligence in his power to convict the felon. And, ſince the caſe is reduced to this hard neceſſity, that either the owner or the buyer muſt ſuffer, the law prefers the right of the owner, who has done a meritorious act by purſuing a felon to condign puniſhment, to the right of the buyer, whoſe merit is only negative, that he has been guilty of no unfair tranſaction. And it is now uſual for the court, upon the conviction of a felon, to order, without any writ, immediate reſtitution of ſuch goods as are brought into court, to be made to the ſeveral proſecutors. Or elſe, ſecondly, without ſuch writ of reſtitution, the party may peaceably retake his goods wherever he happens to find them, unleſs a new property be fairly acquired therein. Or, laſtly, if the felon be convicted and pardoned, or be allowed his clergy, the party robbed may bring his action of trover againſt him for his goods, and recover a ſatiſfaction in damages. But ſuch action lies not before proſecution; for ſo felonies would be made up and healed: and alſo recaption is unlawful, if it be done with intention to ſmother and compound the larceny; it then becoming the heinous offence of *theft-bote*.

It is not uncommon, when a perſon is convicted of a miſdemeanour, which principally and more immediately affects ſome individual, as a battery, impriſonment, or the like, for the court to permit the defendant to *ſpeak with the proſecutor*, before any judgement is pronounced; and if the proſecutor declares himſelf ſatisfied, to inflict but a trivial puniſhment. This is done to reimburſe the proſecutor his expences, and make him ſome private amends, without the trouble and circuity of a civil action. But it is ſurely a dangerous practice; and, though it may be entruſted to the prudence and diſcretion of the judges in the ſuperior courts of record, it ought never to be allowed in local or inferior juriſdictions, ſuch as the quarter-ſeſſions; where proſecutions for aſſaults are by this means too frequently commenced, rather for private lucre than for the great ends of public juſtice. Above all, it ſhould never be ſuffered, where the teſtimony of the proſecutor himſelf is neceſſary to convict the defendant; for by this means the rules of evidence are entirely ſubverted; the proſecutor becomes in effect a plaintiff, and yet is ſuffered to bear witneſs for himſelf. Nay, even a voluntary forgiveneſs by the party injured, ought not, in true policy, to intercept the ſtroke of juſtice. "This (ſays an elegant writer who pleads with equal ſtrength for the *certainty*, as for the lenity of puniſhment) may be an act of good nature and humanity, but it is contrary to the good of the public. For although a private citizen may diſpenſe with ſatisfaction for his private injury, he cannot remove the neceſſity of public example. The right of puniſhing belongs not to any one individual or particular, but to the ſociety in general, or to the ſovereign who repreſents that ſociety; and a man may renounce his own portion of this right, but he cannot give up that of others."

CONVICTION, in *Theology*, expreſſes the firſt degree of repentance, wherein the ſinner becomes ſenſible of his guilt, of the evil nature of ſin, and of the danger of his own ways.

CONVOCATION, an aſſembly of the clergy of England, by their repreſentatives, to conſult of eccleſiaſtical matters. It is held during the ſeſſion of parliament, and conſiſts of an upper and a lower houſe. In the upper ſit the biſhops, and in the lower the inferior clergy, who are repreſented by their proctors; conſiſting of all the deans and archdeacons, of one proctor for every chapter, and two for the clergy of every dioceſe, in all 143 divines; viz. 22 deans, 53 archdeacons, 24 prebendaries, and 44 proctors of the dioceſan clergy. The lower houſe chooſes its prolocutor; whoſe buſineſs it is to take care that the members attend, to collect their debates and votes, and to carry their reſolutions to the upper houſe. The convocation is ſummoned by the king's writ, directed to the archbiſhop of each province, requiring him to ſummon all biſhops, deans, archdeacons, &c.

The power of the convocation is limited by a ſtatute of Henry VIII. They are not to make any canons or eccleſiaſtical laws without the king's licenſe; nor when permitted to make any, can they put them in execution, but under ſeveral reſtrictions. They have the examining and cenſuring all heretical and ſchiſmatical books and perſons, &c. but there lies an appeal to the king in chancery, or to his delegates. The clergy in convocation, and their ſervants, have the ſame privileges as members of parliament.

Since the year 1665, when the convocation of the clergy gave up the privilege of taxing themſelves to the houſe of commons, they ſeldom have been allowed to do any buſineſs; and are generally prorogued from time to time till diſſolved, a new one being generally called along with a new parliament. The only equivalent for giving up the privilege of taxing themſelves, was their being allowed to vote at elections for members to the houſe of commons, which they had not before.

CONVOLUTION, a winding motion, proper to the trunks of ſome plants, as the convolvulus, or bindweed; the claſpers of vines, bryony, &c.

CONVOLVULUS, BIND-WEED; a genus of plants of the pentandria claſs, and in the natural method ranking under the 20th order, *Campanaceæ*. See BOTANY and MATERIA MEDICA *Index*.

CONVOY, in naval affairs, one or more ſhips of war, employed to accompany and protect merchant ſhips, and prevent their being inſulted by pirates, or the enemies of the ſtate in time of war.

CONVOY, in military matters, a body of men that guard any ſupply of men, money, ammunition, or proviſions, conveyed by land into a town, army, or the like, in time of war.

CONUS, a CONE, in *Botany*; a ſpecies of fruit or ſcaly ſeed-veſſel, ſo termed by Tournefort and other botaniſts. Linnæus has ſubſtituted STROBILUS in its place.

CONUS, the *cone-ſhell*, a genus of ſhells. See CONCHOLOGY *Index*.

CONVULSION, a preternatural and violent contraction of the membranous and muſcular parts of the body. See MEDICINE *Index*.

CONWAY, a market-town of Caernarvonſhire in North Wales, ſituated near the mouth of a river of the ſame name, 15 miles weſt of St Aſaph. W. Long. 3. 50. N. Lat. 53. 20.

CONYZA, *Fleabane*; a genus of plants of the ſyngeneſia claſs, ranking under the 49th natural order, *Compoſitæ*. See BOTANY *Index*.

CONZA, a town of the kingdom of Naples in Italy, ſituated in the farther principate, on the river Offanto, 50 miles ſouth-eaſt of the city of Naples. E. Long. 16. 0. N. Lat. 41. 0. It is the ſee of an archbiſhop.

COOK, SIR ANTHONY, deſcended from Sir Thomas Cook lord mayor of London, was born in 1506, and ſuppoſed to have been educated at Cambridge. He was ſo eminent for his learning, piety, and prudence, that the guardians of King Edward VI. appointed him to be his chief inſtructor in learning, and to form his manners. He had four daughters; and being reſolved to have ſons by education, leſt he ſhould have none by birth, he taught his daughters thoſe leſſons by night that he had inſtilled into the prince by day; he was happy in his endeavours, as they proved learned in Greek and Latin, and equally diſtinguiſhed by virtue, piety, and good fortune. Mildred was married to the great Lord Burleigh: Ann to Sir Nicholas Bacon, lord keeper of the great ſeal; Elizabeth to Sir John Ruſſel, ſon and heir of Francis earl of Bedford; and Catharine to Sir Henry Killigrew. He lived in exile during the Marian perſecution; and returning on the acceſſion of Queen Elizabeth, ſpent the reſt of his days in peace and honour, dying in 1576.

COOK, *Captain James*, one of the ableſt and moſt celebrated navigators of any country, was the ſon of James Cook, a labourer or ſervant in huſbandry, and ſuppoſed to have been a native of the county of Northumberland, and was born on the 27th of October 1728, at the village of Marton in the north riding of Yorkſhire. He was one of nine children, all of whom are now dead except a daughter, who married a fiſherman of Redcar. He received the firſt rudiments of education from the ſchoolmiſtreſs of the village; and afterwards, on his father's removal to Great Ayton, he was put to a day-ſchool, at the expence of Mr Skottow his father's employer, where he was inſtructed in writing and in a few of the firſt rules of arithmetic. Before the age of thirteen he was bound apprentice to Mr W. Sanderſon, a haberdaſher or ſhopkeeper at Straiths, about ten miles from Whitby: but ſome diſagreement taking place between him and his maſter, he indulged his own inclination in binding himſelf apprentice to Meſſrs Walkers of Whitby, who had ſeveral veſſels in the coal trade; and after ſerving a few years longer in the ſituation of a common ſailor, he was at length raiſed to be mate of one of Mr Walker's ſhips. During all this period it is not recollected that he exhibited any thing peculiar either in his abilities or conduct.

Early in the year 1755, when hoſtilities broke out between France and England, Cook entered on board the Eagle of ſixty guns, to which veſſel Sir Hugh Palliſer was ſoon after appointed, who ſoon diſtinguiſhed him as an active and diligent ſeamen; and his promotion was forwarded by a letter of recommendation which was written by Mr Oſbaldeſton, member for Scarborough, at the requeſt of ſeveral neighbours, in Mr Cook's favour. On the 15th of May 1759, he was appointed maſter of the Mercury, which ſoon after ſailed to America, and joined the fleet under Sir Charles Saunders at the memorable ſiege of Quebec. His intereſt with the admiralty appears even then to have been very ſtrong; for on Mr Oſbaldeſton's letter he was appointed maſter of the Grampus ſloop; but the proper maſter having unexpectedly returned to her, the appointment did not take place. Four days after he was made maſter of the Garland; when upon inquiry it was found that he could not join her, as the veſſel had already ſailed: and the next day, May 15th 1759, he was made maſter of the Mercury. On this occaſion he was recommended by Captain Palliſer to a difficult and dangerous ſervice, viz. to take the ſoundings of the river St Lawrence, between the iſland of Orleans and the north ſhore, which he performed in the moſt complete manner; and ſoon afterwards he was employed to ſurvey the moſt dangerous parts of the river below Quebec: theſe were his firſt efforts with the pencil. After this expedition he was appointed, on the 22d of September, maſter of the Northumberland, ſtationed at Halifax, where he firſt read Euclid, and applied to aſtronomy and other branches of ſcience. In the year 1762 he was with the Northumberland, aſſiſting at the recapture of Newfoundland; and in the latter end of the ſame year he returned to England, and married, at Barking in Eſſex, Miſs Elizabeth Batts. Early in 1763, when Admiral (then Captain) Greaves was appointed governor of Newfoundland Mr Cook went out with him to ſurvey the coaſts of that iſland. At the end of the ſeaſon he returned to England; but in the beginning of 1764, Sir Hugh Palliſer being appointed governor of Newfoundland and Labradore, Mr Cook accompanied him in the ſame capacity of ſurveyor, and had the Granville ſchooner to attend him on that buſineſs: in this ſituation he continued till 1767.

While Mr Cook remained on this ſtation, he had an opportunity of exhibiting publicly a ſpecimen of his progreſs in the ſtudy of aſtronomy, in a ſhort paper printed in the 57th volume of the Philoſophical Tranſactions, entitled "An obſervation of an eclipſe of the ſun at the iſland of Newfoundland, Auguſt 5. 1766, with the longitude of the place of obſervation deduced from it." Mr Cook's obſervation was made at one of the Burgeo iſlands near Cape Ray, in N. Lat. $47^{\circ}\ 56'\ 19''$; and by the compariſons of it made by Mr Mitchel, with an obſervation of Dr Hornſby at Oxford, it appeared to have been accurately done: and Mr Cook at that time obtained the character of an able aſtronomer.

In the mean time a ſpirit for geographical diſcoveries, which had gradually declined ſince the beginning of the 17th century, began to diſcover itſelf anew. Two voyages of this kind had been performed in the reign of George II. the one under Captain Middleton, the other by Captains Moore and Smyth, with a view to diſcover a northweſt paſſage through Hudſon's Bay to the Eaſt Indies. Two others, under Captains Byron, Wallis, and Carteret, had been undertaken ſoon after the concluſion of the peace in 1763 by order of his preſent majeſty; and before the return of theſe navigators, who were ordered to ſail round the world, another voyage was reſolved upon for aſtronomical purpoſes. It having been calculated that a tranſit of Venus over the ſun's diſk would happen in 1769, a long memorial to his majeſty was preſented by the Royal Society; in which they ſet forth the great importance of making proper obſervations on this phenomenon, the regard that had been paid to it by the different courts of Europe; and intreating, among other things, that a veſſel might be fitted out, at the expence of government, for conveying proper perſons to ſome of the Friendly iſlands, in order to make the neceſſary obſervations. This being complied with on the part of his majeſty, Alexander Dalrymple, Eſq. an eminent member of the Royal Society, was appointed to take the command of the bark appropriated for the purpoſe. In the execution of the project, however, an unexpected difficulty occurred. Mr Dalrymple, ſenſible of the impoſſibility of guiding a veſſel through unknown and dangerous ſeas without any proper command over the crew, demanded a brevet commiſſion as captain of the veſſel, in the ſame manner as had formerly been granted to Dr Halley in a voyage of diſcovery made by him. This commiſſion Sir Edward Hawke abſolutely refuſed to ſign; declaring, when preſſed upon the ſubject, that he would rather ſuffer his right hand to be cut off than truſt any of his majeſty's ſhip's to a perſon who had not been properly bred to the ſervice; and in this proceeding he ſeemed to be juſtified by the mutinous behaviour of Dr Halley's crew; who, denying the legality of his authority over them, had involved him in a very diſagreeable diſpute, and which was attended with pernicious conſequences. Mr Dalrymple, on the other hand, being equally determined in his refuſal to proceed without the authority in queſtion, there was a neceſſity for finding out ſome perſon of ſcience who might alſo be free from the objection made by Sir Edward Hawke. Mr Cook therefore was propoſed by Mr Stephens; and his recommendation being ſeconded by Sir Hugh Palliſer, he was immediately appointed to direct the expedition; and on this occaſion was promoted to the rank of lieutenant in his majeſty's ſervice.

Mr Cook's commiſſion as lieutenant was dated May 25. 1768; a veſſel of 370 tons, named the *Endeavour*, was provided for him; and while the neceſſary preparations were making for the voyage, Captain Wallis returned. It having been recommended to this gentleman to fix upon a proper place for making the aſtronomical obſervations, he had accordingly choſen the iſland named by him *George's Iſland*, but ſince known by the name of *Otaheite*; judging alſo that Port Royal harbour in it would afford an eligible ſituation. This propoſal being accepted, directions for the purpoſe were accordingly given to Mr Cook, with whom Mr Charles Green was joined in the aſtronomical part; the latter having been aſſiſtant to Dr Bradley in the royal obſervatory at Greenwich, and thus judged to be every way qualified for the office. The lieutenant was likewiſe accompanied by Mr Banks, now Sir Joſeph Banks, Dr Solander, &c. The principal deſign of the voyage was, as has already been hinted, to make obſervations on the tranſit of Venus; but this being done, Mr Cook was directed to make further diſcoveries in the Pacific ocean; and on the 30th of July 1768 he ſet ſail on his expedition. An account of the voyage, and the diſcoveries made during the time of it, is given in the next article; here it is ſufficient to obſerve, that throughout the whole Mr Cook approved himſelf an able ſeaman; and from his behaviour both to his own people and to the ſavage nations he occaſionally met with, ſhowed a moſt exact regard to the rules both of juſtice and humanity. On his firſt arrival at Otaheite, the following regulations were drawn up for his people, which he took care ſhould be punctually obeyed.

1. To endeavour, by every fair means, to cultivate a friendſhip with the natives, and to treat them with all imaginable humanity. 2. A proper perſon or perſons to be appointed to treat with the natives for proviſions, fruits, &c. and no other perſon belonging to the ſhip to do ſo without leave. 3. Every perſon on ſhore to attend punctually to his duty, and to pay proper attention to his tools or arms; and if loſt through negligence, to have the full value charged againſt his pay, with ſuch farther puniſhment inflicted as occaſion might require. 4. The ſame penalty to be inflicted on every one who ſhould embezzle, trade with, or offer to trade with, any part of the ſhip's ſtores; and, 5. No iron to be given in exchange for any thing but proviſions. His rigid adherence to theſe rules was manifeſted in ſeveral inſtances, particularly by ſeverely puniſhing the ſhip's butcher, who had threatened the life of a woman, wife to one of the chiefs of the iſland, for refuſing a ſtone hatchet on the terms he propoſed. On erecting their obſervatory, in order to go through the aſtronomical operations, an accident happened which had like to have diſconcerted the whole ſcheme. This was the loſs of their quadrant, which had been ſtolen by ſome of the natives; but, chiefly through the exertions of Mr Banks, it was recovered, and the obſervations made accordingly. Scarce was this accompliſhed, however, before another theft of the natives demanded the moſt ſerious conſideration of the commander. Some of them taking advantage of the attention of the officers being otherwiſe engaged, took the opportunity of breaking into one of the ſtore-rooms, and ſtealing from thence a bag of ſpike nails of no leſs than an hundred weight. This was a moſt important affair; for as thoſe nails were of great eſtimation among the Indians, the poſſeſſion of ſuch a quantity muſt undoubtedly have much leſſened their value, and thus rendered proviſions of every kind greatly dearer on the iſland than before. One of the thieves therefore being diſcovered, was puniſhed with 200 laſhes; notwithſtanding which he obſtinately refuſed to diſcover any of his accomplices. Repeated thefts committed afterwards required all the wiſdom and reſolution of Mr Cook to conduct himſelf in a proper manner. After due conſideration, he judged it to be a matter of importance to put an end to theſe practices at once, by doing ſomething which might engage the natives themſelves to prevent them for their common intereſt. This, however, he was not at preſent able to accompliſh; nor indeed did it ſeem poſſible to prevent them without uſing fire-arms, which from motives of humanity he ſtill determined to avoid. At laſt, after a ſtay of three months, when preparing to take his leave, the moſt diſagreeable adventure took place that he had hitherto met with. This was the deſertion of two of his people, who having married young women of that country, determined to take up their reſidence in it. Mr Cook was now obliged to ſeize ſome of the chiefs, and to inform them that they could not obtain their liberty unleſs the deſerters were recovered. This at laſt produced the deſired effect; the deſerters were given up, and Mr Cook ſet ſail, along with Tupia (who had formerly been the prime miniſter to Oberea, a princeſs of the iſland) and a boy of 13 years of age, both of whom were deſirous of accompanying him to England.

While Mr Cook proceeded to viſit others of the South ſea iſlands, Tupia occaſionally ſerved as an interpreter. On his arrival in New Zealand, Mr Cook found the people extremely hoſtile and inſolent. At their very firſt meeting, one of the natives having threatened to dart his lance into the boat, was ſhot dead. Another, having carried off Mr Green's hanger was fired at with ſmall ſhot; and upon his ſtill refuſing to reſtore it, was fired at with ball and killed. This, however, produced very little effect on the reſt, who offered to make an attack upon them, till ſeveral muſkets were fired with ſmall ſhot, which wounded three or four more. Next day the commander, having determined to force ſome of the natives on board, in order to conciliate their affections by kind treatment, directed his men to follow two canoes whom he perceived under way before him. One made her eſcape, but the other, not obſerving the boats in purſuit, was overtaken; on which the ſavages plied their oars ſo briſkly, that the ſhip's boats were not able to keep up with them. Tupia, whoſe language the New Zealanders underſtood, called to them to return, with aſſurances that no hurt ſhould be done them; but they continued their flight without minding him. A muſket was then fired over their heads with a view to intimidate them, but upon this they prepared to fight; and on the coming up of the boats began the attack with ſo much vigour, that the lieutenant's people were obliged to fire upon them with ball, by which four out of ſeven that were in the boat were killed, and the other three jumped into the water, and were taken on board.

This part of Mr Cook's conduct ſeems inconſiſtent with that humanity for which he was in general ſo eminently diſtinguiſhed; he was aware of the cenſure, and makes the following apology. "Theſe people certainly did not deſerve death for not chooſing to confide in my promiſes, or not conſenting to come on board my boat, even if they had apprehended no danger; but the nature of my ſervice required me to obtain a knowledge of their country, which I could no otherwiſe obtain but by forcing into it in an hoſtile manner, or gaining admiſſion through the confidence and good will of the people. I had already tried the power of preſents without effect; and I was now prompted by my deſire to avoid farther hoſtilities, to attempt to get ſome of them on board; the only method we had left of convincing them that we intended them no harm, and had it in our power to contribute to their gratification and convenience. Thus far my intentions certainly were not criminal; and though in the conteſt, which I had not the leaſt reaſon to expect, our victory might have been complete without ſo great an expence of life; yet in ſuch ſituations, when the command to fire has once been given, no man can pretend to reſtrain its exceſs, or preſcribe its effect."

Notwithſtanding the diſaſter juſt mentioned, to which the three New Zealanders, who were taken on board, had been witneſſes, they were ſoon conciliated, and began to ſing with a degree of taſte that ſurpriſed the Engliſh gentlemen. They were boys, the oldeſt about 19 and the youngeſt about 11; but no kindneſs which could be ſhown them was in any degree effectual to bring about a reconciliation with the reſt. On the contrary, having perceived the ſhip in ſome diſtreſs, they inſtantly ſhowed a diſpoſition to make an attack; and from this they were only prevented by the firing of a four-pounder charged with grape-ſhot. Even this did not produce any permanent effect; another attack was determined upon, and would undoubtedly have been made, had not Tupia informed them, that if they perſiſted in their attempt, the arms of their adverſaries, like thunder, would deſtroy every one of them. This was enforced by the fire of another four-pounder with grape-ſhot, which ſpreading wide in the water, terrified them to ſuch a degree that they began to paddle away as faſt as poſſible. Notwithſtanding this, however, ſome intercourſe began to take place; but in every inſtance the New Zealanders manifeſted their hoſtility and treachery in ſuch a manner as ſhowed that they were not to be gained by fair means. At laſt an attempt to carry off Tayeto, Tupia's boy, rendered it abſolutely neceſſary to fire upon them in order to reſcue him from certain deſtruction, ſome of the ſavages having got him into a canoe, where they held him down by violence. In conſequence of this one of the ſavages was killed on the ſpot, and ſeveral more wounded, by the diſcharge of muſkets from the boats; Tayeto recovered his liberty, jumped into the water, and ſwam to the ſhip. Some partial intercourſe again took place: but ſtill it appeared that the innate rancour of theſe ſavages was not to be ſubdued by any fair means; and it was only by the powerful arguments of cannon and muſketry that they could be kept from attempting to do miſchief.

From the account of this voyage publiſhed by Dr Hawkeſworth, indeed, it appears, that a conſiderable number of ſavages periſhed in a ſimilar manner to that above mentioned, and they ſeem to have manifeſted a more hoſtile behaviour than afterwards: on thoſe melancholy occaſions, however, it is obſerved to the honour of Mr Cook, that his humanity was eminently conſpicuous beyond that of the common people, who all along ſhowed as much inclination to deſtroy the Indians as a ſportſman does to kill the game he purſues.

While Mr Cook coaſted the iſlands of New Zealand, he was ſometimes in the moſt imminent danger of being ſhipwrecked. In the latitude of 35° ſouth, and in the midſt of ſummer in that climate, he met with ſuch a gale of wind as he ſcarce ever experienced before; ſo that he was no leſs than three weeks in getting ten leagues to the weſtward, and two more before he could get 30 leagues farther. Fortunately, however, they were all this time a conſiderable way from land, otherwiſe it is probable that the ſtorm muſt have proved fatal.

Mr Cook having ſpent ſix months in circumnavigating and fully exploring the iſlands of New Zealand, he ſailed from thence on the 31ſt of March 1770. It muſt be obſerved, however, that the extreme hoſtility manifeſted by the inhabitants in that part of the iſland where he firſt arrived, was not univerſally diffuſed; but that a friendly intercourſe was for a long time maintained with thoſe about Queen Charlotte's Sound. From New Zealand he proceeded to New Holland, and on the 28th of April came in ſight of Botany Bay. Here all their endeavours to induce the natives to have any intercourſe with them proved ineffectual, though happily there was no blood ſpilt in any quarrel.

During their navigation round New Holland, the coaſts of which are full of dangerous rocks and ſhoals, our navigators were brought into a more perilous ſituation than ever; and from which the eſcape was ſo extraordinary, that it deſerves a particular relation. This happened on the 10th of June 1770, as they purſued their courſe from Trinity Bay, and nearly in the latitude aſſigned to the iſlands diſcovered by Quiros. At that time they had the advantage of a fine breeze and a clear moonlight; and in ſtanding off from ſix till near nine o'clock, the ſhip had deepened her water from 14 to 21 fathoms; but, while the navigators were at ſupper, it ſuddenly ſhoaled to 12, 10, and 8 fathoms in the ſpace of a few minutes. Every thing was then ready for putting the ſhip about, when they ſuddenly got into deep water again, and continued in 20 and 21 fathoms for ſome time, ſo that the gentlemen went to bed in perfect ſecurity. A little before eleven, however, the water ſhoaled at once from 20 to 17 fathoms; and before the lead could be heaved again, the ſhip ſtruck, and remained immoveable, excepting as far as ſhe was heaved up and down, and daſhed againſt the rocks by the ſurge. The alarm was now univerſal, and not indeed without the greateſt reaſon. It appeared that the veſſel had been lifted over the ledge of a rock, and lay in a hollow within it, where there were in ſome places from three to four fathoms water, and in others ſcarcely as many feet: the ſheathing boards were disjoined, and floating round the ſhip in great numbers; and at laſt the falſe keel alſo was deſtroyed, while the rock kept grating her bottom with ſuch force as to be heard in the fore ſtore-room. It was now neceſſary to lighten the ſhip as much as poſſible: and this was done with all expedition to the amount of more than 50 tons. In the morning of the 11th of June they diſcovered the land at about eight leagues diſtance, without any iſland between, on which, they could have been ſent aſhore in the event of the ſhip going to pieces, that ſo they might have been carried to the main land by turns. To add to their diſtreſs, the ſhip drew ſo much water, that it was with difficulty kept under with three pumps. Laſtly, it appeared, that even the riſing of the tide, on which they had ultimately depended for relief, was inſufficient to anſwer the purpoſe as the day tide fell conſiderably ſhort of that in the night-time. Having therefore lightened the ſhip ſtill farther, by throwing out every thing that could poſſibly be ſpared, they waited with patience for the next tide; when, after incredible exertion, the ſhip righted, and they got her over the ledge of the rock into deep water. By continual labour, however, the men were at laſt ſo much exhauſted, that they could not ſtand to the pumps more than five or ſix minutes at a time; after which they threw themſelves flat on the deck, though a ſtream of water between three and four inches deep ran over it; and in this ſituation, they lay till others, exhauſted as well as themſelves, took their places, on which they ſtarted up again, and renewed their exertions. In this dreadful extremity, Mr Monkhouſe, a midſhipman, propoſed the expedient of fothering the ſhip, as it is called, by which means he ſaid that he had ſeen a merchant ſhip brought from Virginia to London after ſhe had ſprung a leak that admitted more than four feet water in an hour. The expedient being approved of, it was put in execution in the following manner. He took a lower ſtudding-ſail, and having mixed a large quantity of oakum and wool together, ſtitched them down by handfuls as lightly as poſſible; the whole being afterwards ſpread over with the dung of the ſheep and other filth. The ſail was then hauled under the ſhip's bottom by means of ropes which kept it extended. When it came under the leak, the wool and oakum, with part of the ſail, were forced inwards by the preſſure of the water, which thus prevented its own ingreſs in ſuch an effectual manner, that one pump, inſtead of three, was now ſufficient to keep it under. Thus they got the ſhip into a convenient port on the coaſt of New Holland, where they had an opportunity of repairing the injury. Here they diſcovered that their preſervation had not been owing entirely to the expedient above mentioned; for one of the holes was in a great meaſure filled up by a piece of rock which had broken off and ſtuck in it; and this hole was ſo large, that had it not been filled up in the manner juſt mentioned, they muſt undoubtedly have periſhed notwithſtanding all the aſſiſtance that could have been derived from the pumps.

The dangers they ſuſtained in navigating this coaſt were innumerable, inſomuch that for very near three months they were obliged to have a man conſtantly in the chains heaving the lead. They were always entangled among rocks and ſhoals, which could not have failed to deſtroy a leſs experienced navigator; and even Mr Cook, with all his ſagacity, could not ſometimes have extricated himſelf, had it not been for the favourable interpoſition of ſome natural events, which no human penetration could foreſee or have the leaſt dependence upon. Of this we ſhall only give the following inſtance. Having at laſt, as they thought, got ſafely over the vaſt reefs of ſunk rocks with which the coaſt of New Holland is ſurrounded, they flattered themſelves that all danger was paſt, and the vaſt ſwell of the water convinced them that they were now in the open ocean. The remembrance of former dangers, however, induced them frequently to take the precaution of ſounding; notwithſtanding which, in the latitude of about 14½° S. they found themſelves one morning only about a mile diſtant from the moſt hideous breakers, though the ſea all around was unfathomable. Their ſituation was rendered the more dreadful by its being a dead calm, at the ſame time that they were carried towards the rock with ſuch rapidity, that by the time they had got the ſhip's head turned by means of the boats, ſhe was ſcarcely 100 yards diſtant from it. Their only reſource then was to tow the ſhip, if poſſible, by means of the boats and pinnace, out of a ſituation ſo very perilous; but all their efforts would have been unſucceſsful, had not a breeze of wind ſprung up, which, though too light to have been noticed at any other time, was found to ſecond their efforts ſo effectually, that the ſhip began to move perceptibly from the reef in an oblique direction: during the time that this breeze laſted, which was not more than ten minutes, they had made a conſiderable way. A dead calm ſucceeding, they began to loſe ground, and in a little time were driven within 200 yards of the rocks: but fortunately the breeze returned, and laſted ten minutes more; during which time a ſmall opening was perceived in the reef at the diſtance of about a quarter of a mile. The mate being ſent out to examine this opening, reported that it was not more than the length of the ſhip in breadth, but that there was ſmooth water within. On this it was determined to puſh into it by all means. The attempt failed of ſucceſs; as, juſt when they had brought the ſhip with great labour to the mouth of the opening, they found a current ſetting out from it by reaſon of the tide now beginning to ebb. But though their hopes were diſappointed in getting through the opening, they were, by the current ſetting out from it, driven in a very ſhort time to the diſtance of a quarter of a mile from the rocks; and by dint of towing and other exertions, they were got by noon to the diſtance of two miles. This temporary deliverance, however, afforded but ſmall proſpect of being ultimately relieved. They had ſtill no other expectation than of being forced back into their former ſituation by the return of the tide; but happily they now perceived another opening about a mile to the weſtward. Mr Hicks the lieutenant being ſent to examine this opening, returned with an account of its being narrow and hazardous, but capable of being paſſed. To this place therefore the ſhip was directed by every poſſible means; and a light breeze happening to ſpring up, they fortunately reached it, and were inſtantly hurried through with great rapidity by the current of the returning tide; which, had it not been for this opening, would undoubtedly have daſhed them to pieces againſt the rocks.

From the time they quitted the coaſt of New Holland till their arrival at Batavia in the iſland of Java, our navigators met with no other danger but what is common in ſea voyages. They were obliged to ſtay for ſome time at this place to repair their damages; and on viewing the condition of the ſhip, found they had more reaſon than ever to admire the manner in which they had been preſerved. Both the falſe-keel and main-keel were greatly injured; great part of the ſheathing was torn off; ſeveral of the planks were much damaged, and among theſe there were two, and half of another, which for ſix feet in length were not above the eighth part of an inch in thickneſs, beſides being penetrated with worms quite to the timbers. Here the crew were exceſſively annoyed by ſickneſs, which obliged them to remain much longer than they would otherwiſe have done: and it is worthy of notice, that every one of the crew was ill excepting the ſail-maker, an old man between 70 and 80 years of age, and who was drunk every night. Poor Tupia, with his boy Tayeto, fell ſacrifices to the unhealthineſs of the climate, as well as the ſurgeon, three ſeamen, and Mr Green's ſervant. Nor did the evil ſtop here; for on their ſetting out from Batavia, the ſeeds of diſeaſe which had been received there broke out in the moſt violent and fatal manner, inſomuch that in the courſe of about ſix weeks there died one of Mr Banks's aſſiſtants, by name Mr Sporing, Mr Parkinſon his natural hiſtory painter, Mr Green the aſtronomer, the boatſwain, carpenter, and mate, Mr Monkhouſe the midſhipman, the corporal of the marines, two of the carpenter's crew, and nine ſeamen. Even the jolly old ſail-maker could now hold out no longer; but whether his death might not in ſome meaſure be attributed to his being leſs plentifully ſupplied with liquors than formerly, might have deſerved inquiry. Theſe unfortunate events probably made a conſiderable impreſſion on Mr Cook's mind; and perhaps induced him to direct his attention to thoſe methods of preſerving the health of ſeamen which he afterwards put in execution with ſo much ſucceſs. After touching at St Helena, they continued their voyage for England, where they arrived on the 11th of June 1771: and on the 29th of Auguſt the ſame year, his majeſty teſtified his approbation of Mr Cook's conduct by appointing him a captain in the navy. On this occaſion Mr Cook wiſhed to have been advanced to the rank of poſt-captain, which, though not more profitable than the other, is more honourable; but this being inconſiſtent with the rules of preferment in the navy, the earl of Sandwich, at that time at the head of the admiralty, could not agree to it.

Captain Cook was not allowed to remain long inactive. The idea of a ſouthern continent had long been entertained, and Mr Dalrymple had renewed the attention of the public towards the queſtion, by his hiſtorical collection of voyages to the Pacific ocean, publiſhed in two quarto volumes, one in 1770, the other in 1771. To determine the matter finally, Captain Cook was again ſent out: and the object of this voyage was not merely to ſettle the queſtion juſt mentioned, but to extend the geography of the globe to its utmoſt limits. That the undertaking might be carried on with the greater advantage, it was determined to employ two ſhips, on the choice and equipment of which the utmoſt attention was beſtowed. The ſucceſsful voyage which had already been made in the Endeavour, ſuggeſted the idea of that ſhip being a proper model for the two which were to be ſent out; and the opinion of Lord Sandwich concurring with the general idea, two veſſels, conſtructed by the ſame perſon who had built the Endeavour, were purchaſed for the voyage. Theſe were about 14 or 16 months old at the time they were purchaſed; and, in the opinion of Captain Cook, were as fit for the purpoſe as if they had been but newly built. The larger of the two, of 462 tons burden, was named the *Reſolution;* the ſmaller, of 336 tons, had the name of the *Adventure:* the complement of men on board the former, of which Captain Cook was commander, being 112; on the latter, commanded by Mr Tobias Furneaux, 81. In their equipment, every article that could be ſuppoſed neceſſary, however much out of the common line, was procured, and every circumſtance that could be ſuppoſed to contribute to the ſucceſs of the voyage was attended to in the moſt ſcrupulous manner. Beſides the uſual ſtores and proviſions, all of which were of the beſt kinds, the ſhips were furniſhed with malt, ſour-krout, ſalted cabbage, portable ſoup, ſalop, muſtard, marmalade of carrots, beer, and inſpiſſated wort. Mr Hodges, an excellent landſcape painter, was engaged to make drawings and paintings of ſuch objects as required them. Mr John Reinhold Forſter, with his ſon, were both engaged, in order to explore and collect the natural hiſtory of the countries through which they paſſed; and laſtly, that nothing might be wanting to render the voyage as complete as poſſible, Mr William Wales and Mr William Bayley were engaged by the board of longitude to make celeſtial obſervations. They were furniſhed with the beſt inſtruments of every kind, and among the reſt with four time-pieces; three conſtructed by Mr Arnold, and one by Mr Kendal on Mr Harriſon's principles.

At Plymouth Captain Cook received his inſtructions; which were not only to ſail round the globe, but to ſail round it in high ſouthern latitudes, and to make ſuch traverſes as might finally reſolve the queſtion concerning the ſouthern continent. In purſuance of theſe inſtructions he ſet ſail on the 13th of July 1772, and on the 29th of the ſame month reached the Madeiras. As he proceeded afterwards in his voyage, he made three puncheons of beer from the inſpiſſated wort carried out along with him, and found it excellently to anſwer the purpoſe, provided the material could have been kept without fermentation in its inſpiſſated ſtate; but as this was found impoſſible, the expedient ſeems to have failed. In this voyage, however, the captain uſed with the greateſt ſucceſs ſuch methods as appeared likely to contribute to the preſervation of the health of his men. In rainy weather, he took care that the ſhip ſhould be aired and dried by means of fires made between the decks, the damp places were ſmoked, and the people were ordered to air their bedding, and waſh and dry their clothes, whenever an opportunity offered. Thus he reached the Cape of Good Hope without having a ſingle man ſick. Having left it and kept on his courſe to the ſouthward, he ſoon began to meet with cold and ſtormy weather, by which he loſt almoſt the whole of his live ſtock of ſheep, hogs, and geeſe. The bad effects of this ſtormy weather upon the men were guarded againſt by an addition to their clothing, and giving them a dram on particular occaſions. On the ſixth of December, being in the latitude of 50° 40′, he fell in with iſlands of ice, and continued among them in various latitudes till the 17th of January 1773; when he ſet ſail for New Zealand, which he reached on the 27th.

The reception of our navigator by the New Zealanders was now much more friendly than in the former voyage, ſo that there were no conteſts with the natives; nor did Captain Cook obſerve any one of thoſe whom he had ſeen before, neither was there the ſmalleſt remembrance of former hoſtilities. Having ſtaid in this country till the 7th of June, our navigators ſet ſail for Otaheite; but during the voyage the crews of both ſhips were attacked by the ſcurvy. Thoſe of the Adventure were in a very ſickly ſtate; the cook was dead, and 28 of her beſt men incapable of duty. On board the Reſolution matters were much better; and the only reaſon that could be conjectured for the difference was, that the people of the Adventure had been in a habit of body more inclined to the ſcurvy than thoſe of the Reſolution, and had eaten fewer vegetables. Here it was obſerved, that the averſion of ſeamen to a change of diet is ſo great, that it can only be overcome by the ſteady and perſevering example of a commander. While he remained at New Zealand, the captain had diſcovered a tree which greatly reſembled the American black ſpruce. Perſuaded, therefore, that it would be attended with effects equally ſalutary on the health of the people, he employed them in brewing beer from it. This was done while they continued at Duſky Bay, in order to ſupply the want of vegetables, which were not to be procured there; but on removing to Queen Charlotte's Sound, they were more fortunate. Captain Cook himſelf went to look out for antiſcorbutic vegetables; and returned in a very ſhort time with a boat-load of ſcurvy-graſs, celery, &c. Theſe were boiled with the peas and wheat; and though ſome of the people diſliked them at firſt, they ſoon became ſo ſenſible of their good effects, that they cheerfully followed the example of the reſt: and the freedom of the crew from the ſcurvy and other diſtempers was by every one attributed to the New Zealand ſpruce beer and vegetables. From this time forward the captain had ſcarce occaſion to give orders for gathering vegetables when they came to any land.

During this voyage Captain Cook experienced another narrow eſcape from ſhipwreck. Being becalmed at the diſtance of half a league from a reef of rocks near Oſnaburgh iſland, it was found neceſſary to order out the boats to tow off the ſhips; but this was found impoſſible. The calm continuing, and the ſituation of our navigators becoming every moment more dangerous, the captain attempted to get through an opening in the reef which he had judged practicable; but on approaching it, found that there was not ſufficient depth of water; at the ſame time that the draught of the tide through it forced the ſhip thither in a manner ſcarce to be reſiſted. One of the warping machines, with about 400 fathoms of rope, was then ordered out, but did not produce any effect. They were within two cables length of the breakers, and no bottom could be found for caſting anchor. Having no other reſource, however, they did drop an anchor; but before it took hold, the Reſolution was in leſs than three fathoms water, and ſtruck at every fall of the ſea, which broke violently cloſe under her ſtern, threatening deſtruction to every one on board. At laſt the tide ceaſing to act in the ſame direction, the boats were ordered to try to tow off the veſſel; in which being aſſiſted by the land-breeze, which fortunately ſprung up at that inſtant, they with much labour ſucceeded.

Having ſpent a conſiderable time in the South Sea iſlands, Captain Cook returned to New Zealand, and from thence ſet ſail for the ſouthern part of the continent of America. Here he explored all the iſlands in the neighbourhood, and then returned to England, where he arrived in ſafety on the 30th of July 1774, having been abſent three years and 18 days; and in all that time loſt only one man, who died of a conſumption probably begun before he ſet out on the voyage.

The reception our navigator now met with was ſuited to his merit. He was immediately raiſed to the rank of poſt-captain, and ſoon after unanimouſly elected a member of the Royal Society; from whom he received the prize of the gold medal for the beſt experimental paper that had appeared throughout the year. It was the cuſtom of Sir John Pringle, at the delivery of this medal, annually, to make an elaborate diſcourſe, containing the hiſtory of that part of ſcience for which the medal was given; and, as the ſubject of Captain Cook's paper (the means of preſerving the health of ſeamen) was analogous to the profeſſion of Sir John Pringle himſelf as a phyſician, he had the greater opportunity of diſplaying his eloquence on the occaſion. The ſpeech he made was in the higheſt degree honourable to Captain Cook. He remarked, that the ſociety had never more meritoriouſly beſtowed the medal than on the perſon who now received it. "If (ſays he) Rome decreed the civic crown to him who ſaved the life of a ſingle citizen, what wreaths are due to the man who, having himſelf ſaved many, perpetuates in your Tranſactions the means by which Britain may now, on the moſt diſtant voyages, preſerve numbers of her intrepid ſons, her mariners; who braving every danger, have ſo liberally contributed to the fame, to the opulence, and to the maritime empire of the country?" Theſe honourable teſtimonies of the public regard, however, Captain Cook did not receive, being already embarked on another voyage, from which he never returned.

The third voyage of this celebrated navigator was not undertaken by any expreſs command of his majeſty. Captain Cook had already done ſo much, that it was thought but reaſonable he ſhould now ſpend the remainder of his life in quiet; and in order to enable him to do this in a more comfortable manner, beſides his rank of poſt-captain in the navy, he was alſo made a captain in Greenwich. Still, however, there were ſome points in the ſcience of geography which had very much engaged the attention of the public, and were indeed of ſuch importance as to become a national concern. Theſe were to diſcover the connection between Aſia and America, and to determine whether there was not a poſſibility of ſhortening the paſſage to the Eaſt Indies by ſailing round the northern parts of the continents of Europe and Aſia. Many attempts, indeed, had already been made by various navigators of different nations; but all of them had failed, and, what was worſe, had left the point ſtill undetermined. An act of parliament had been paſſed in 1745, by which a reward of 20,000l. was held out to the ſhips of any of his majeſty's ſubjects for accompliſhing this important voyage, but without mentioning any thing of thoſe belonging to his majeſty; and this reward was further confined to the finding out of the north-weſt paſſage to the Eaſt Indies through Hudſon's bay. In the year 1776, however, both the errors juſt mentioned were corrected. It was now enacted, "That if any ſhip belonging to any of his majeſty's ſubjects, or to his majeſty, ſhall find out, and ſail through, any paſſage by ſea between the Atlantic and Pacific oceans, in any direction or parallel of the northern hemiſphere, to the northward of the 52d degree of northern latitude; the owners of ſuch ſhips if belonging to any of his majeſty's ſubjects, or the commanders, officers, and ſeamen, of ſuch ſhip belonging to his majeſty, ſhall receive, as a reward for ſuch diſcovery, the ſum of 20,000l.

It was not, as has already been hinted, now deemed proper to ſolicit Captain Cook to undergo freſh dangers by undertaking a voyage of this kind; nevertheleſs, as he was univerſally looked upon to be the fitteſt perſon in the kingdom for the purpoſe, the eyes of every one were tacitly fixed upon him: he was conſulted on every thing relating to it, and ſolicited to name the perſon whom he judged moſt proper to conduct it. To determine this point, Captain Cook, Sir Hugh Palliſer, and Mr Stephens, were invited to the houſe of Lord Sandwich to dinner; where, beſides the conſideration of the proper officer for conducting the expedition, many things were ſaid concerning the nature of the deſign. They enlarged upon its grandeur and dignity, its conſequences to navigation and ſcience, and the completeneſs it would give to the whole ſyſtem of diſcoveries; until at laſt Captain Cook was ſo much inflamed by the repreſentation of the importance of the voyage, that he ſtarted up, and declared that he would conduct it himſelf. This was what the parties preſent had deſired, and probably expected; his offer was therefore inſtantly laid before the king, and Captain Cook appointed commander of the expedition by the 10th of February 1776. At the ſame time it was agreed, that on his return from the voyage, he ſhould be reſtored to his place at Greenwich; and if no vacancy occurred during the interval, the officer who ſucceeded him was to reſign in his favour. The inſtructions he now received were, that he ſhould attempt the high latitudes between the continents of Aſia and America, and if poſſible return to England along the northern coaſts of Aſia and Europe. This was moſt probably the reſult of the captain's own deliberations, and what had been ſuggeſted by him to Lord Sandwich and other people in power. He was particularly deſired to ſail firſt into the Pacific ocean through the chain of newly diſcovered iſlands which he had lately viſited. After having croſſed the equator, and paſſed into the northern parts of the ocean juſt mentioned, he was then to hold ſuch a courſe as might tend to ſettle many intereſting points of geography, and produce ſome intermediate diſcoveries, before he arrived at the main ſcene of operation. With regard to this principal object, he was ordered, immediately on his arrival on the coaſt of New Albion, to proceed northward as far as the latitude of 65 degrees, without loſing any time in exploring creeks or rivers previous to his arrival in that latitude; and for his further encouragement, the act of 1745, offering a premium for the diſcovery of the paſſage, was amended in the manner above mentioned That nothing might be wanting which could promote the ſucceſs of the grand expedition, Lieutenant Pickerſgill was ſent out, in 1776, with directions to explore the coaſts of Baffin's bay; and the next year Lieutenant Young was commiſſioned not only to examine the weſtern parts of that bay, but to endeavour to find a paſſage on that ſide from the Atlantic to the Pacific ocean. Nothing, however, was performed by either of theſe gentlemen which in the leaſt could promote Captain Cook's ſucceſs. Two veſſels were provided as in the former voyage, viz. the Reſolution and the Diſcovery; the command of the former being given to Captain Cook, and of the latter to Captain Charles Clerke. The only thing in which the appointment of the Diſcovery differed from that of the Reſolution was, that the former had no marine officer on board. Every degree of attention was beſtowed, as in the former voyage, upon the proper victualling and other neceſſaries for the two ſhips; and that the inhabitants of thoſe countries which our navigator intended to viſit might derive ſome permanent benefit from the intercourſe they had with him, it was determined to ſend abroad a breed of domeſtic animals, and likewiſe a quantity of uſeful ſeeds, to be left in proper places. With this view, a bull, two cows with their calves, and ſeveral ſheep, with hay and corn for their ſubſiſtence, were taken on board; and it was likewiſe propoſed to take in others at the Cape of Good Hope. A large aſſortment of iron tools and trinkets was alſo ſent out; and, in ſhort, every thing that could be judged proper either to conciliate the good will of the natives or to prove ſerviceable to them, was provided for the voyage, as well as every convenience for the ſhips companies. In the former voyage Captain Cook had brought along with him a native of one of the South ſea iſlands, named *Omai*, who reſided in England during the interval between the ſecond and third voyages, and was now happy at getting an opportunity of returning to his own country. Though he could by no means complain of the entertainment he had met with in England, the idea of returning home loaded with treaſure, which might enable him to make a figure among his countrymen, ſoon overcame all uneaſy ſenſations, which the leaving of his Engliſh friends might excite. His majeſty had taken care to furniſh him with every thing that could poſſibly be of uſe when he came to his native country; and he had beſides received ſeveral valuable preſents from Lord Sandwich, Sir Joſeph Banks, and ſeveral ladies and gentlemen of his acquaintance; ſo that nothing was omitted which could poſſibly be done to convey, by his means, to the inhabitants of the South Sea iſlands, an idea of the Britiſh power and greatneſs.

Every thing being prepared for the voyage, our navigator ſet ſail from the Nore on the 25th of June 1776; but by reaſon of ſome delay in receiving his inſtructions, did not leave Plymouth till the 12th of July. He had not been long at ſea before he began his operations for preſerving the health of his people; which were found equally efficacious in this as in the former voyage. Finding his ſtock of provender for the animals on board likely to run ſhort, he touched at Teneriffe, in order to procure a ſupply, having judged that to be a more proper place than Madeira for the purpoſe. On ſailing from thence he ran a great riſk of running upon ſome ſunk rocks on the iſland of Bonaviſta; but in this, as well as on other occaſions of danger, he behaved with the ſame judgment, coolneſs, and preſence of mind, that diſtinguiſhed him throughout the whole courſe of his life. On the 12th of Auguſt he arrived before Port Praya, in one of the Cape de Verd iſlands named *St Jago;* but not finding it neceſſary to go in there, he continued his voyage to the ſouthward. The weather now becoming gloomy and rainy, required a continuance of the methods he had already practiſed for preſerving the health of his people; and, as formerly, they were attended with the greateſt ſucceſs. In this voyage, the effect of theſe precautions was the more remarkable, as at this time the ſeams of the veſſel were opened to ſuch a degree as to admit the rain, ſo that ſcarce any perſon on board could lie dry in his bed; and all the officers in the gun-room were driven out of their cabins by the water which came through the ſides. Such was the humanity of the commander, however, that while the ſhips continued at ſea, he would not truſt the workmen over their ſides to repair the defects, though caulkers were employed in the inſide as ſoon as ſettled weather returned. On the 1ſt of September our navigators croſſed the equator, and on the 18th of October anchored in Table bay at the Cape of Good Hope. Here they met with a violent tempeſt, the effects of which were felt both on ſea and land. It laſted three days, and the Reſolution was the only ſhip in the bay that rode out the ſtorm without dragging her anchors. On ſhore the tents and obſervatory were deſtroyed, and the aſtronomical quadrant narrowly eſcaped irreparable damage. The Diſcovery, which had been ſome time later in ſailing from England, was driven off the coaſt, and did not arrive till the 10th of November.

While they remained in this place, a diſaſter happened which threatened the loſs of moſt of their live ſtock. The bulls and two cows had been put aſhore to graze among other cattle; but Captain Cook had been adviſed to keep the ſheep, 16 in number, near the tents, where they were penned in every night. Some dogs having got in among them in the night-time, killed four, and diſperſed the reſt. Six of them were recovered the next day, but the two rams and two of the fineſt ewes in the flock were miſſing. The captain applied to Baron Plettenberg the governor; but all his endeavours were unſucceſsful, until he employed ſome of the meaneſt and loweſt of the people, fellows whoſe character was, that for a ducatoon they would cut their maſter's throat, burn the houſe over his head, and bury him and his whole family in aſhes. This is mentioned as an inſtance how far the boaſted policy of the Dutch government at the Cape of Good Hope falls ſhort of its alleged perfection. After all, two of the fineſt ewes in the flock were miſſing, and never could be recovered. The captain, therefore, to repair this loſs, and to make an addition to his original ſtock, purchaſed two young bulls, two ſtone horſes, two mares, two heifers, two rams, ſeveral ewes and goats, with ſome rabbits and poultry; when, having finiſhed all his buſineſs, he ſet ſail on the 30th of November, though it was not till the 3d of December that he got clear of land. Soon after his putting to ſea, he had the miſfortune to loſe ſeveral of the goats, eſpecially the males, together with ſome ſheep; and it was with the utmoſt difficulty that the reſt of the cattle were preſerved, by reaſon of the ſhip toſſing and tumbling about in a very heavy ſea. Having explored ſome deſolate iſlands in the ſouthern ſeas, Captain Cook ſet ſail for New Zealand. During this part of the voyage, our navigators were involved in ſo thick a fog, that, according to the authors of Captain Cook's life, "they ſailed 300 leagues in the dark." The firſt land they afterwards reached was New Holland; where having remained till the 30th of January 1777, they ſet ſail for New Zealand, and on the 12th of February they anchored in Queen Charlotte's Sound. Here the people were ſhy and timorous, on account of their having formerly deſtroyed 10 of Captain Furneaux's people, who had been ſent aſhore to gather vegetables. The cauſe of the quarrel could not be known, as none of the party were left alive to tell the news. Lieutenant Burney, who went aſhore in queſt of them, found only ſome fragments of their bodies; from which it appeared that they had been killed and eaten by the ſavages. It was not the intention of Captain Cook, at this diſtance of time, to reſent the injury; he even refuſed to put to death a chief named *Kahoora*, who, as he was informed by the natives themſelves, had killed Mr Rowe the commander of the party. He was, however, particularly careful that no opportunity ſhould now be given the ſavages of committing ſuch an action with impunity; and with this view a boat was never ſent on ſhore without being well armed, and the men under the command of ſuch officers as could be depended upon. The New Zealanders were no ſooner aſſured of Captain Cook's pacific diſpoſition, than they threw aſide their fears and ſuſpicions, and entered into a commercial intercourſe with the people. It would have been the leſs excuſable in Captain Cook to have revenged at this time the maſſacre of Mr Rowe's party, as he was aſſured that the quarrel originated from ſome petty thefts of the ſavages, which were too haſtily reſented on the part of the Britiſh; and had it not been for this, no miſchief would have happened.

On the 25th of February our navigator left New Zealand, taking with him, at the requeſt of Omai, two boys, the eldeſt about 18 and the youngeſt about 10. Theſe were ſoon cured of their paſſion for travelling, being both violently ſea-ſick; but as it was then too late to repent, they expreſſed their grief in loud and almoſt continual lamentation; and this in a kind of ſong which ſeemed to conſiſt of the praiſes of their native country, whence they were now to be ſeparated for ever. By degrees, however, the ſea-ſickneſs abated, their lamentations became leſs frequent, and at laſt ceaſed entirely; their native country was forgotten, and they appeared to be as firmly attached to their new friends the Engliſh as if they had been born among them.

So much time was now ſpent in ſailing up and down in the Pacific ocean, where ſeveral new iſlands were diſcovered, that Captain Cook judged it impoſſible to accompliſh any thing for this year in the high northern latitudes; for which reaſon he determined to bear away for the Friendly iſlands, in order to ſupply himſelf with thoſe neceſſaries which he had found impoſſible to be got at any of the iſlands which he had juſt diſcovered. In his run thither ſeveral new iſlands were viſited; and in proſecuting theſe diſcoveries our navigator once more narrowly eſcaped being ſhipwrecked. The danger at this time aroſe from a low ſandy iſland, which the Reſolution was very near running upon. From this ſhe was only ſaved by the circumſtance of all the men having been accidentally called upon deck to put the veſſel about, and moſt of them being at their ſtations when the danger was diſcovered. Soon after this both ſhips ſtruck upon ſome ſunk coral rocks, but happily were go off without damage.

After a ſtay of between two and three months, Captain Cook took leave of the Friendly iſlands on the 13th of July 1777; and on the 12th of Auguſt reached Otaheite, where he introduced Omai to his country people, and whoſe reception by them is particularly related under the next article. Here the captain found the people of Otaheite ready to engage in a war with thoſe of Eimeo; but though ſtrongly ſolicited by the former to aſſiſt them in an expedition againſt their enemies, he refuſed to take any concern in the affair, alleging, by way of excuſe, that the people of Eimeo had never offended him. This ſeemed to ſatisfy moſt of the chiefs; but one, named *Towha*, was ſo much diſpleaſed, that Captain Cook could never regain his favour. He even threatened, that as ſoon as the captain ſhould be gone, he would make war upon Otoo, one of the princes of theſe iſlands whom he knew to be in ſtrict friendſhip with him; but from this he was deterred by the captain's threatening to return and chaſtiſe him if he made any ſuch attempt. As a mark of Otoo's friendſhip, he gave our navigator a canoe, which he deſired him to carry to the king of Britain, having nothing elſe, as he ſaid, worth his acceptance.

From Otaheite Captain Cook proceeded to Eimeo, where, on account of ſome thefts committed by the natives, he was obliged to commence hoſtilities, by burning a number of their war canoes, and even ſome houſes. Theſe tranſactions gave him much concern; and the more that he had been ſo much ſolicited to make war on theſe people by his friends at Otaheite, to whoſe intreaties he had refuſed to liſten. From Eimeo he proceeded to Huaheine, where he ſaw Omai finally ſettled, and left with him the two New Zealand youths already mentioned. The youngeſt of theſe was ſo much attached to the Engliſh, that it was neceſſary to carry him out of the ſhip and put him aſhore by force. During his ſtay on this iſland, the captain was obliged to puniſh a thief with greater ſeverity than he had ever done before, viz. by cauſing his head and beard to be ſhaved, and his ears cut off. Some other diſagreeable tranſactions took place, particularly the deſertion of two of his people, who were not recovered without the greateſt difficulty. In the courſe of his exertions for their recovery, he found it neceſſary to detain the ſon, daughter, and ſon-in-law, of the chief of an iſland named *Otaha*. This had almoſt produced very ſerious conſequences, the natives having formed a plot for carrying off Captain Cook himſelf, as well as Captain Clerke and Mr Gore. With regard to the commander, they were diſappointed by his own caution and vigilance; but Meſſrs Clerke and Gore were in particular danger: and it was only owing to the circumſtance of one of them having a piſtol in his hand as they walked together on ſhore, that they were not ſeized.

Having left the Society iſlands, and diſcovered a new group, which in honour of his patron the earl of Sandwich, our commander named the *Sandwich Iſles*, he ſet out on the 2d of January 1778 on his voyage northward. In this he was very ſucceſsful, aſcertaining the vicinity of the continents of Aſia and America, which had never been done, or but very imperfectly, before. From theſe deſolate regions he returned to the iſland of Oonalaſhka; whence, having refitted and taken in proviſions, he returned to the ſouthward, and on the 26th of November reached the Sandwich iſlands, where he diſcovered a new one named *Mowee*, and on the 30th of the ſame month another of much larger extent, named *O-why-hee*. Seven weeks were ſpent in exploring the coaſts of this iſland; and during all this time he continued to have the moſt friendly intercourſe with the people, who, however, appeared to be much more numerous and powerful than thoſe of any iſland our navigators had yet touched at. Several of the chiefs and principal people had attached themſelves greatly to the commander, and in general the people appeared to be much more honeſt in their diſpoſitions than any whom he had ever viſited. But by the time he had finiſhed his circumnavigation of the iſland, and caſt anchor in a bay called *Karakakooa*, matters were greatly altered. An univerſal diſpoſition to theft and plunder had now taken place; and in this it was evident that the common people were encouraged by their chiefs, who ſhared the booty with them. Still, however, no hoſtilities were commenced: the greateſt honours were paid to the commander; and, on his going aſhore, he was received with ceremonies little ſhort of adoration. A vaſt quantity of hogs and other proviſions were procured for the ſhips; and on the 4th of February 1779, they left the iſland, not without moſt magnificent preſents from the chiefs, and ſuch as they had never before received in any part of the world. Unluckily they met with a ſtorm on the ſixth and ſeventh of the ſame month; during which the Reſolution ſprung the head of her foremaſt in ſuch a manner that they were obliged to return to Karakakooa bay to have it repaired. As they returned, Captain Cook had an opportunity of ſhowing his humanity to the people, by the relief he afforded to ſome of their canoes which had ſuffered in the ſtorm. The ſame friendly intercourſe which had formerly been held with the natives now commenced, and Captain Cook was treated with the uſual honours; but on the 13th of this month it was unhappily broken off on the following account. One of the natives being detected in ſtealing the tongs from the armourer's forge in the Diſcovery, was diſmiſſed with a pretty ſevere flogging; but this example was ſo far from being attended with any good effect, that in the afternoon another, having ſnatched up the tongs and a chiſſel, jumped overboard with them and ſwam for the ſhore. The maſter and midſhipman were inſtantly deſpatched in purſuit of him; but he eſcaped on board a canoe, which paddled away ſo quickly that the cutter could not come near it. A chief named *Pareah*, who was at this time on board the Reſolution, underſtanding what had happened, promiſed to go aſhore and get back the ſtolen goods; but before this could be done, the thief had made his eſcape into the country. Captain Cook, who was at that time aſhore, had endeavoured to intercept the canoe when it landed, but was led out of the way by ſome of the natives who pretended to be his guides. The tongs and chiſſel, however, were brought back to the maſter as he advanced to the landing place; but he being now joined by ſome of the reſt of the people in the pinnace, could not be ſatisfied with the recovery of the ſtolen goods, but inſiſted upon having the thief or the canoe which carried him by way of repriſal. On his preparing to launch this laſt into the water, he was interrupted by Pareah, who inſiſted that it was his property, and that he ſhould not take it away. As the officer paid no regard to his remonſtrances, Pareah, who ſeems to have been a very ſtrong man, ſeized him, pinioned his arms behind, and held him faſt by the hair of the head. On this one of the ſailors ſtruck the chief with an oar; on which, quitting the officer, he inſtantly ſnatched the oar out of the man's

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hand, and broke it in two acroſs his knee. The Indians then attacked the ſailors with ſtones, and ſoon drove them to their boats, to which they were forced to ſwim, as they lay at ſome diſtance from the ſhore. The officers who could not ſwim retired to a ſmall rock, where they were cloſely purſued by the Indians; and here the maſter narrowly eſcaped with his life, till Pareah returned and obliged the Indians to give over their attacks. The gentlemen, ſenſible that Pareah's preſence alone could protect them, entreated him to remain with them till they could be brought off in the boats. On his refuſal, the maſter ſet out to the place where the obſervatories had been erected, for farther aſſiſtance; but Pareah, who met him, and ſuſpected his errand, obliged him to return. In the mean time the multitude had begun to break in pieces the pinnace, after having taken every thing out of her that was looſe: on the return of Pareah, however, they were again diſperſed, and ſome of the oars reſtored, after which the gentlemen were glad to get off in ſafety. Before they reached the ſhip Pareah overtook them in a canoe, and delivered the midſhipman's cap which had been taken from him in the ſcuffle; he alſo joined noſes with them in token of friendſhip, and deſired to know whether Captain Cook would kill him on account of what had happened. They aſſured him that he would not, and made ſigns of reconciliation on their part. On this he left them and paddled over to the town of Kavaroah; and that was the laſt time that he was ſeen by the Engliſh. In the night-time the ſentinels were much alarmed by ſhrill and melancholy ſounds from the adjacent villages, which they took to be the lamentations of the women. Next day it was found that the large cutter of the Diſcovery had been carried off in the night-time; on which Captain Cook ordered the launch and ſmall cutter to go under the command of the ſecond lieutenant, and to lie off the eaſt point of the bay in order to intercept all the canoes that might attempt to get out, and if neceſſary to fire upon them. The third lieutenant of the Reſolution was diſpatched to the weſtern part of the bay on the ſame ſervice; while the maſter was ſent in purſuit of a large double canoe already under ſail, and making the beſt of her way out of the harbour. He ſoon came up with her, and by firing a few ſhots, obliged her to run on ſhore, and the Indians to leave her. This was the canoe belonging to a chief named *Omea*, whoſe perſon was reckoned equally ſacred with that of the king; and to the neglect of ſecuring him we may attribute the ſucceeding diſaſter. Captain Cook now formed the reſolution of going in perſon to ſeize the king himſelf in his capital of Kavaroah; and as there was reaſon to ſuppoſe that he had fled, it was his deſign to ſecure the large canoes, which on that account he cauſed to be hauled up on the beach. With this view he left the ſhip about ſeven o'clock in the morning of Sunday the 14th of February, being attended by the lieutenant of marines, a ſerjeant, corporal, and ſeven private men. The crew of the pinnace, under the command of Mr Roberts, were alſo armed: and as they rowed towards the ſhore, the captain ordered the launch to leave her ſtation at the oppoſite point of the bay, in order to aſſiſt his own boat. Having landed with the marines at the upper end of the town, the Indians flocked round him, and proſtrated themſelves before him. No ſign of hoſtility, nor even much alarm, appeared; the king's ſons waited on the commander as ſoon as he ſent for them, and by their means he was introduced to the king, who readily conſented to go on board; but in a little time the Indians began to arm themſelves with long ſpears, clubs, and daggers, and to put on thick mats which they uſe as defenſive armour. This hoſtile appearance was greatly augmented by an unlucky piece of news which was juſt now brought by a canoe, viz. that one of the Indian chiefs had been killed by the people in the Diſcovery's boats. On this the women, who had hitherto ſat on the beach converſing familiarly, and taking their breakfaſts, removed, and a confuſed murmur ran through the crowd. An old prieſt now appeared with a cocoa-nut in his hand, which he held out as a preſent to Captain Cook, ſinging all the while, and making a moſt troubleſome noiſe as if he meant to divert the attention of the captain and his people from obſerving the motions of the Indians, who were now everywhere putting on their armour. Captain Cook beginning to think his ſituation dangerous, ordered the lieutenant of the marines to march towards the ſhore, as he himſelf did, having all the while hold of the king's hand, who very readily accompanied him, attended by his wife, two ſons, and ſeveral chiefs. The Indians made a lane for them to paſs; and as the diſtance they had to go was only about 50 or 60 yards, and the boats lay at no more than five or ſix yards diſtance from land, there was not the leaſt apprehenſion of the cataſtrophe which enſued. The king's youngeſt ſon Keowa went on board the pinnace without the leaſt heſitation, and the king was about to follow, when his wife threw her arms about his neck, and, with the aſſiſtance of two chiefs, forced him to ſit down. The captain might now have ſafely got aboard, but did not immediately relinquiſh the deſign of taking the king along with him. Finding at laſt, however, that this could not be accompliſhed without a great deal of bloodſhed, he was on the point of giving orders for the people to reimbark, when one of the Indians threw a ſtone at him. This inſult was returned by the captain, who had a double-barrelled piece, by a diſcharge of ſmall ſhot from one of the barrels. This had little effect, as the man had a thick mat before him; and as he now brandiſhed his ſpear, the captain knocked him down with his muſket. The king's ſon, Keowa, ſtill remaining in the pinnace, the detaining him would have been a great check upon the Indians; but unluckily Mr Roberts, who commanded the pinnace, ſet him aſhore at his own requeſt ſoon after the firſt fire. In the mean time another Indian was obſerved in the act of brandiſhing his ſpear at the commander; who thereupon was obliged to fire upon him in his own defence. Miſſing his aim, however, he killed one cloſe by his ſide: upon which the ſerjeant obſerving that he had miſſed the man he aimed at, received orders to fire alſo, which he did, and killed him on the ſpot. This repreſſed the foremoſt of the Indians, and made them fall back in a body; but they were urged on again by thoſe behind, and diſcharged a volley of ſtones among the marines, who immediately returned it by a general diſcharge of their muſkets; and this was inſtantly followed

Cook.

ed by a fire from the boats. Captain Cook expreſſed his aſtoniſhment at their firing, waved his hand to them to ceaſe, and called to the people in the boats to come nearer to receive the marines. This order was obeyed by Mr Roberts; but the lieutenant who commanded the launch, inſtead of coming nearer, put off to a greater diſtance; and by this prepoſterous conduct deprived the unfortunate commander of the only chance he had for his life: for now the Indians, exaſperated by the fire of the marines, ruſhed in upon them and drove them into the water, leaving the captain alone upon the rock. A fire indeed was kept up by both boats; but the one was too far off, and the other crowded with the marines, ſo that they could not direct their fire with proper effect. Captain Cook was then obſerved making for the pinnace, carrying his muſket under his arm, and holding his other hand on the back-part of his head to guard it from the ſtones. An Indian was ſeen following him, but with marks of fear, as he ſtopped once or twice ſeemingly undetermined to proceed. At laſt he ſtruck the captain on the back of the head with a club, and then precipitately retreated. The latter ſtaggered a few paces, and then fell on his hand and one knee, and dropped his muſket. Before he could recover himſelf, another Indian ſtabbed him with a dagger in the neck, though ſtill without putting an end to his life. He then fell into a pool of water knee-deep, where others crowded upon him: but ſtill he ſtruggled violently with them, got up his head, and looked towards the pinnace as if ſoliciting aſſiſtance. The boat was not above five or ſix yards diſtant; but ſuch was the confuſed and crowded ſtate of the crew, that no aſſiſtance could be given him. The Indians then got him under again, but in a deeper water, though he ſtill continued to ſtruggle, and once more got his head up; but being quite ſpent he turned towards the rock as if to ſupport himſelf by it, when a ſavage ſtruck him with a club, which probably put an end to his life, as he was never ſeen to ſtruggle any more. The ſavages hauled his lifeleſs body upon the rocks, and uſed it in the moſt barbarous manner, ſnatching the daggers out of one another's hands, in order to have the pleaſure of mangling it. If any thing could add to the misfortune of this celebrated navigator's death, it was, that even his mangled remains were not ſaved from the hands of the barbarians. The lieutenant already mentioned, who, by his removing to a diſtance when he ought to have come on ſhore, ſeemed to have been the occaſion of his death, returned on board without making any attempt to recover his body; though it appeared from the teſtimonies of four or five midſhipmen who arrived ſoon after at the fatal ſpot, that the beach was almoſt deſerted by the Indians, they having at laſt yielded to the continual fire from the boats. The officer alledged in his own excuſe for removing at firſt from the ſhore, that he miſtook the ſignals; but be this as it will, the complaints againſt him were ſo many and ſo great, that Captain Clerke was obliged publicly to take notice of them, and to take the depoſitions of his accuſers in writing.—Theſe papers, however, were not found, and it is ſuppoſed that the captain's bad ſtate of health had induced him to deſtroy them. After all, we are informed that, in the opinion of Captain Philips who commanded the marines, it is very doubtful whether any effectual relief could have been given to the commander, even if no miſtake had been committed on the part of the lieutenant. The author of all the miſchief was Pareah, the chief already mentioned, who had employed people to ſteal the boat in the night-time. The king was entirely innocent both of the theft and the murder of Captain Cook; but the latter was perpetrated by ſome chiefs who were his near relations. The chief who firſt ſtruck him with a club was named *Karimans raha*, and he who ſtabbed him with the dagger was called *Nooah*. The latter, Mr Samwell, from whoſe narrative this account is taken, obſerves, was ſtout and tall, had a fierce look and demeanour, and united in his perſon the two properties of ſtrength and agility more than he had ever obſerved in any other perſon.—Both of them were held in great eſtimation by their countrymen on account of the hand they had in his death.

By reaſon of the barbarous diſpoſition of the Indians, it was found impoſſible to recover Captain Cook's body after the firſt opportunity already mentioned was loſt. By dint of threats and negociations, however, ſome of the principal parts were procured with great difficulty; by which means the navigators were enabled to perform the laſt offices to their much reſpected commander. Theſe being put into a coffin, and the ſervice read over them, were committed to the deep with the uſual military honours on the 21ſt of February 1779. Soon after his death a letter was iſſued by M. de Sartine, ſecretary to the marine department of France, and ſent to all the commanders of French ſhips, importing, that Captain Cook ſhould be treated as the commander of a neutral and allied power; and that all captains of armed veſſels who might meet with him, ſhould make him acquainted with the king's orders, but at the ſame time let him know, that on his part he muſt refrain from hoſtilities. This humane and generous proceeding, with regard to France, originated from M. Turgot; but the thought ſeems firſt to have ſtruck Dr Franklin. Thus much at leaſt is certain, that the doctor, while ambaſſador from the United States, wrote a circular letter to the American naval commanders ſomething to the purport of that already mentioned; but in this he was not ſupported by Congreſs; for an edict was inſtantly iſſued, that ſpecial care ſhould be taken to ſeize Captain Cook if an opportunity of doing it occurred. The Spaniards proceeded in the ſame manner, and both acted on a principle equally mean and abſurd, that the obtaining a knowledge of the weſtern coaſt of America, or of a northern paſſage into the Pacific ocean, might be attended with ſome bad conſequence to their reſpective ſtates.

Captain Cook was a man of plain addreſs and appearance, but well looked, and upwards of ſix feet high. His head was ſmall, and he wore his hair, which was brown, tied behind. His face was full of expreſſion; his noſe exceedingly well ſhaped; his eyes, which were ſmall and of a brown caſt, were quick and piercing; his eyebrows prominent, which gave his countenance altogether an air of auſterity. Notwithſtanding this, it was impoſſible for any one to excel him in humanity, as is evident from the whole tenor of his behaviour both to his own people and the many ſavage nations with whom he had occaſion to interfere. This amiable property diſcovered itſelf even in the final cataſtrophe of his life; his utmoſt care being directed to the preſervation of his people, and the procuring them a ſafe retreat to their boats. And it cannot be enough lamented, that he who took ſo much care of others, ſhould have periſhed in ſuch a miſerable manner for want of being properly ſupported by them. The perſeverance with which he purſued every object which happened to be pointed out as his duty was unequalled. Nothing ever could divert him from what he had once undertaken; and he perſevered in the midſt of dangers and difficulties which would have diſheartened perſons of very conſiderable ſtrength and firmneſs of mind. For this he was adapted by nature, having a ſtrong conſtitution, inured to labour, and capable of undergoing the greateſt hardſhips. His ſtomach bore without difficulty the coarſeſt and moſt ungrateful food; and he ſubmitted to every kind of ſelf-denial with the greateſt indifference. To this ſtrength of conſtitution he joined an invincible fortitude of mind, of which the circumnavigation of New Holland, and his voyage towards the South Pole, furniſh innumerable inſtances. He was maſter of himſelf on every trying occaſion; and the greater the emergency, the greater always appeared his calmneſs and recollection: ſo that in the moſt dangerous ſituations, after giving proper directions to his people, he could ſleep ſoundly the hours that he had allotted to himſelf. That he poſſeſſed genius in an eminent degree cannot be queſtioned; his invention was ready, and capable not only of ſuggeſting the moſt noble objects of purſuit, but the moſt proper methods of attaining them. His knowledge of his own profeſſion was unequalled; and to this he added a very conſiderable proficiency in other ſciences. In aſtronomy, he became ſo eminent, that he was at length enabled to take the lead in making the aſtronomical obſervations during the courſe of his voyages. In general learning he likewiſe attained to ſuch a proficiency as to be able to expreſs himſelf with clearneſs and propriety; and thus became reſpectable as the narrator, as well as the performer, of great actions. He was an excellent huſband and father, ſincere and ſteady in his friendſhip, and poſſeſſed of a general ſobriety and virtue of character. In converſation he was unaffected and unaſſuming; rather backward in puſhing diſcourſe, but obliging and communicative to thoſe who wiſhed for information: and he was diſtinguiſhed by a ſimplicity of manners almoſt univerſally the attendant of truly great men. With all theſe amiable qualities, the captain was occaſionally ſubject to a haſtineſs of temper, which has been ſet forth in its utmoſt extent, if not exaggerated by ſome, though but few, who are not his friends: but even theſe, as well as others, when taking a general view of his character, are obliged to acknowledge that he was undoubtedly one of the greateſt men of his age.

Captain Cook is diſtinguiſhed as an author by an account of his ſecond voyage written by himſelf. His firſt voyage, as well as that of ſeveral other navigators, had been recorded by Dr Hawkeſworth; but on the preſent occaſion it was not judged neceſſary to have recourſe to any other than the pen of the author himſelf; and his journal, with a few occaſional alterations, and being divided into chapters, was ſufficient for the purpoſe. The ſtyle is clear, natural, and manly; and it is not improbable, that even a pen of more ſtudied elegance could not have made it appear to more advantage. When it appeared, which was not till ſome time after the author had left England, the book was recommended by the accuracy and excellency of its charts, and by a numerous collection of fine engravings done from the original drawings of Mr Hodges.

We cannot conclude this article without taking ſome notice of the honours paid to our celebrated navigator after his death, both by his own countrymen and thoſe of other nations. Perhaps indeed it may be ſaid with juſtice, that foreigners hold his memory in an eſtimation unequalled even in this country; a remarkable proof of which occurs in the eulogy upon him by Michael Angelo Gianetti, read in the Florentine academy on the 9th of June 1785, and publiſhed at Florence the ſame year. It is ſaid alſo, that one of the French literary academies propoſed a prize for the beſt eulogium on Captain Cook; and many poetical teſtimonies of his merit appeared in our own language. The Royal Society of London reſolved to teſtify their reſpect to him by a medal, for which purpoſe a voluntary ſubſcription was opened. A gold medal was given to ſuch of the fellows as ſubſcribed 20 guineas, and a ſilver one to thoſe who ſubſcribed ſmaller ſums; and each of the other members received one of bronze. Thoſe who ſubſcribed 20 guineas were, Sir Joſeph Banks preſident, the prince of Anſpach, the duke of Montague, Lord Mulgrave, and Meſſrs Cavendiſh, Peachey, Perrin, Poli, and Shuttleworth. Many deſigns were propoſed on the occaſion; but the following was that which was actually ſtruck. On one ſide was the head of Captain Cook in profile, with this inſcription round it, JAC. COOK OCEANI INVESTIGATOR ACERRIMUS; and on the exergue, REG. SOC. LOND. SOCIO SUO. On the reverſe is a repreſentation of Britannia holding a globe, with this inſcription round her, NIL INTENTATUM NOSTRI LIQUERE; and on the exergue, AUSPICIIS GEORGII III. One of the gold medals ſtruck on this occaſion was preſented to the king, another to the queen, and a third to the prince of Wales. Another was ſent to the French king on account of the protection he had granted to the ſhips; and a ſecond to the empreſs of Ruſſia, in whoſe dominions they had been treated with every expreſſion of friendſhip and kindneſs. Both theſe great perſonages condeſcended to accept of the preſent with marks of ſatisfaction. The French king wrote a handſome letter to the Society, ſigned by himſelf, and underſigned by the marquis de Vergennes; and the empreſs of Ruſſia commiſſioned Count Oſterman to ſignify to Mr Fitzherbert the ſenſe ſhe had of the value of the preſent, and that ſhe had cauſed it to be depoſited in the muſeum of the Imperial Academy of Sciences. As a further teſtimony of the pleaſure ſhe derived from it, the empreſs preſented to the Royal Society a large and beautiful gold medal, containing on one ſide the effigies of herſelf, and on the other a repreſentation of the ſtatue of Peter the Great. After the general aſſignment of the medals, which took place in 1784, there being a ſurplus of money ſtill remaining, it was reſolved by the preſident and council, that an additional number of medals ſhould be thrown off, to be diſpoſed of in preſents to Mrs Cook, the earl of Sandwich, Dr Benjamin Franklin, Dr Cook, provoſt of King's College Cambridge, and Mr Planta. At the ſame time it was agreed that Mr Aubert ſhould be allowed to have a gold medal of Captain Cook, on his paying for the gold, and the expence of ſtriking it, in conſideration of his intention to preſent it to the king of Poland.

During the two viſits of the ſhips at Kamtſchatka, Major Behm, the commandant of that province, had beſtowed, in the moſt liberal manner, every kind of aſſiſtance which it was in his power to beſtow; and ſuch was the ſenſe entertained by the lords of the admiralty of the kindneſs he had ſhowed, that they determined to make him a preſent of a magnificent piece of plate, with an inſcription expreſſive of his humane and generous conduct. The inſcription was drawn up by Dr Cook, and afterwards ſubmitted to the opinion and correction of ſome gentlemen of the firſt eminence in claſſical taſte.

Sir Hugh Palliſer, who had all along diſplayed an uncommon reſpect and kindneſs for Captain Cook, likewiſe diſplayed his regard for his memory in a moſt eminent manner. On his eſtate in Buckinghamſhire he conſtructed a ſmall building with a pillar, containing the character of Captain Cook, which is given at the end of the introduction to the laſt voyage. This was drawn up by the honourable Admiral Forbes, admiral of the fleet, and general of the marines, to whom Captain Cook was known only by his merit and extraordinary actions.

Amidſt all theſe expreſſions of unavailing praiſe, it was not forgotten to ſhow ſome eſſential ſervice to the widow and family of our celebrated navigator. A memorial for a penſion of 200l. per annum was given in to the king from the commiſſioners of his admiralty, and ſigned by the earl of Sandwich, Mr Butler, the earl of Liſburne, Mr Penton, Lord Mulgrave, and Mr Mann. His majeſty complied with the requeſt of the memorial, and the grant was paſſed through the uſual forms with all poſſible ſpeed. By this 200l. per annum were ſettled on the widow during life; and 25l. a-year on each of her three ſons. After her death the 200l. was to be divided between her children; a fourth was allotted to Captain King, and the remaining fourth to Mr Bligh and the repreſentatives of Captain Clerke.

The laſt honour paid to the memory of Captain Cook was the granting a coat of arms to the family, which was done by patent on the 3d of September 1785: and of this we have the following deſcription. Azure, between the two polar ſtars, Or; a ſphere on the plane of the meridian, north pole elevated, circles of latitude for every ten degrees, and of longitude for every 15; ſhowing the Pacific ocean between 60° and 240° weſt, bounded on one ſide by America, and on the other by Aſia and New Holland; in memory of the diſcoveries made by him in that ocean, ſo very far beyond all former navigators. His track thereon is marked with red lines; and for creſt, in a wreath of the colour is an arm imbowed, veſted in the uniform of a captain of the royal navy. In the hand is the union jack, on a ſtaff proper. The arm is encircled by a wreath of palm and laurel.

Cook's Diſcoveries.—The number of countries diſcovered by Captain Cook, and which had never before been viſited by any European, is very conſiderable; but it was a remarkable property of our celebrated navigator, that, wherever he touched, every thing relative to the place was determined with ſuch accuracy and preciſion, that all former accounts ſeemed to go for nothing, and the diſcovery to belong entirely to Captain Cook. Thus it was not unuſual with him to make diſcoveries in places already well known; and thus his voyages have conveyed a vaſt fund of knowledge perfectly original. Though the accounts of the different places, therefore, at which he touched, are particularly given under their names in the order of the alphabet, we ſhall in this article endeavour to join the whole together in ſuch a manner as to give the reader ſome idea of the benefit which has accrued to ſcience from voyages attended not only with much expence and labour, but even with the loſs of the celebrated navigator's life.

1 Madeira, a volcanic iſland.

When he ſet out in the Endeavour in the year 1768, the firſt place he touched at was Madeira. Here Mr Banks and Dr Solander, beſides ſome additions to the ſcience of botany, diſcovered undoubted marks of the iſland having a volcanic origin. On leaving this place, they found it neceſſary to touch at Rio de Janeiro for proviſions, and, during the run thither, the commander had an opportunity of determining the cauſe of the luminous appearance of the ſea.

2 Luminous appearance of the ſea occaſioned by animals.

On the 29th of October they obſerved that the water frequently emitted flaſhes like lightning, though much ſmaller; but ſuch was their frequency, that eight or ten of them were viſible almoſt at the ſame moment. This appearance they found, both at this time and afterwards, to ariſe from a ſmall kind of animal with which the water abounded. Whilſt ſtaying at Rio de Janeiro, a melancholy obſervation was made of the prodigious waſte of human lives with which the working of the Portugueſe gold mines was attended, no fewer than 40,000 negroes being annually imported for this purpoſe, none of whom, it ſeems, ſurvive the labour of the year; and our navigator was informed, that in 1766 this number was ſo far ſhort, that they were obliged to draught 20,000 more from the town of Rio itſelf.

3 Vaſt number of negroes deſtroyed by the working the gold mines.

Proceeding from thence to the ſouthern coaſts of America, he had an opportunity of determining a queſtion of great importance to navigation, viz. whether, in ſailing to the Pacific ocean, it is better to paſs through the ſtraits of Magellan, or to double Cape Horn, and ſail through thoſe of Le Maire? From Captain Cook's voyage it appears, contrary to the opinion of former navigators, that the latter is the preferable paſſage.

4 Beſt paſſage into the Pacific ocean through the ſtraits Le Maire.

Through this he was only 33 days in coming round the land of Terra del Fuego from the eaſt entrance of the ſtrait of Le Maire till he had advanced about 12 degrees to the weſtward, and three and a half to the northward of Magellan's ſtraits. During all this time the ſhip ſcarcely received any damage, though if he had paſſed the other way he could not have accompliſhed his paſſage in leſs than three months, beſides immenſe fatigue to his people and damage to the ſhip.

5 Exceſſive ſtorms and cold in the ſouthern regions.

In theſe ſtormy regions, however, he experienced the ſame inconveniencies felt by other navigators; ſuch a ſea being met with off Cape Diego, that the ſhip frequently pitched her bowſprit under water. Here alſo the exceſſive cold and mutability of weather in theſe ſouthern regions was experienced in ſuch a manner as had nearly proved fatal to ſome of the gentlemen who ſailed along with him. Dr Solander, Mr Banks, Mr Monkhouſe the ſurgeon, and Mr Green the aſtronomer, with their attendants and ſervants, ſet out on a botanical expedition while the ſhip lay at anchor in the bay of Good Succeſs. It was then the middle of ſummer, and the morning on which they ſet out was as mild and warm as it uſually is in the month of May in England: but having aſcended a mountain for the purpoſe of botanizing, they were ſurpriſed by ſuch ſtorms of ſnow and hail that they could not get back that night. Dr Solander, who warned them of their danger, that people when about to periſh with cold were ſeized with a violent inclination to ſleep, was the firſt who ſeemed likely to fall a victim to it; and it was not in the power of his companions to keep him from ſitting down for that purpoſe. He was awakened in a few minutes; but during this ſhort interval his feet had become ſo much diminiſhed by the contraction of the veſſels, that his ſhoes fell off from them when he was again made to riſe.

6
Miſerable ſtate of the natives.

Even theſe dreary regions, however, are not without inhabitants, whom our voyagers juſtly concluded to be the loweſt of the human ſpecies. Indeed, conſidering the little convenience they have, it is wonderful how they can reſiſt the ſeverity of the climate, for they are almoſt without clothing; they dwell in miſerable hovels, which admit both the wind and ſnow or rain; and they have not any utenſil for dreſſing their food. Neverthcleſs, theſe miſerable creatures, as they appeared to our navigators, ſeemed to have no wiſh to poſſeſs more than they enjoyed; and they were abſolutely indifferent about every thing that was offered them, except large beads which they would take as ornaments. Hence Dr Hawkeſworth, who wrote the account of the voyage, concludes, that theſe people may be on a level with ourſelves with reſpect to the real happineſs they enjoy.

7
Iſlands diſcovered between Cape Horn and Otaheite.

On the 26th of January 1769 our navigators left Cape Horn; and from that time to the firſt of March, during which they run no leſs than 660 leagues, met with no current by which the ſhip was affected. Hence it is probable, that during all this time they had never been near any land, the currents of the ocean being uſually met with in the neighbourhood of iſlands. Several iſlands, however, were diſcovered before they reached Otaheite, on which they beſtowed the names of Lagoon Iſland, Thrumb-cap, Bow Iſland, the Groups, Bird Iſland, and Chain Iſland. All theſe ſeemed to be inhabited, and were covered with a moſt delightful verdure; which appeared to the greater advantage, as our navigators had for a long time ſeen no land but the dreary hills and waſtes of Terra del Fuego.

8
Tranſit of Venus obſerved.

Having arrived at Otaheite, they ſet about obſerving the tranſit of Venus over the ſun, which indeed was the main purpoſe for which the voyage had been undertaken. The anxiety which they underwent when the time of the expected phenomenon approached may eaſily be imagined, as the whole depended on the circumſtance of a clear ſky, which though more readily to be expected in that climate than one more to the northward, was ſtill a matter of uncertainty. In conſequence of ſome hints which had been given by the earl of Morton, Captain Cook determined to ſend out two parties to different places to make the obſervations; by which means there would be a chance of ſucceſs, even if thoſe at Otaheite ſhould fail. For this purpoſe he ſent Mr Gore in the long boat to Eimeo, a neighbouring iſland, along with Mr Monkhouſe, Mr Banks, and Mr Sporing, who were furniſhed with proper inſtruments by Mr Green the aſtronomer. Meſſrs Hicks, Clerke, Pickerſgill, and Saunders, were ſent in the pinnace to a convenient ſpot to the eaſtward of the main obſervatory, where they were likewiſe ordered to make obſervations with ſuch inſtruments as they had. The day on which the tranſit happened was the 3d of June 1769, when they had the ſatisfaction to ſee the ſun riſe without a cloud; and as the weather continued equally clear throughout the day, there was the beſt opportunity of making the obſervations in a proper manner. All of them ſaw an atmoſphere or duſky cloud round the planet, which diſturbed their obſervation, and probably cauſed them to differ from each other more conſiderably than they would otherwiſe have done. According to Mr Green, the times of ingreſs and egreſs of the planet were as follow:

Morning.	h.	min.	ſec.
Firſt external contact, - -	9	25	42
Firſt internal contact, or total immerſion,	9	44	4
Afternoon.			
Second internal contact. - -	3	14	8
Second external contact, or end of the tranſit,	3	32	10

From theſe obſervations the latitude of the obſervatory was found to be 17° 29′ 15″ S. and the longitude 149° 32′ 30″ W. of Greenwich. Several curious remarks were made both on the country itſelf, and on the inhabitants.

9
Otaheite a volcanic iſland.

Mr Banks, in an excurſion up the country, diſcovered many traces of volcanic fire; the ſtones, like thoſe of Madeira, had evidently the appearance of being burnt, and the very clay on the hills had the ſame appearance.

10
Account of the natives.

The natives, though addicted to thieving, appeared in general harmleſs and friendly, and very ready to ſupply the ſhip with neceſſaries in exchange for ſuch things as they wanted. The articles on which they ſet the greateſt value were hatchets, axes, large nails, ſpikes, looking-glaſſes, and beads. They were alſo fond of fine linen, whether white or printed; but an axe of the value of half a crown would buy more proviſions than a piece of cloth of the value of 20 ſhillings. They are very fickle and inattentive; ſo that it was not poſſible to engage them to pay any regard to the worſhip of the Deity which they ſaw performed before them; nor would they attend to any explanation of it that was given them. They are not, however, deſtitute of a religion of their own; and are particularly careful of the repoſitories of the dead, which they will not allow to be violated on any account. Of this Captain Cook had an inſtance, when ſome of his people offered to take down an incloſure of one of theſe repoſitories. They were violently oppoſed by the natives, who ſent a meſſenger to acquaint them that they would never ſuffer any ſuch thing; and the only inſult that ever was offered to an Engliſhman by the people of this iſland was on a ſimilar account. From Otaheite our navigators carried with them Tupia, formerly high prieſt of the country, and prime miniſter to Queen Oberea. From his practice it appeared, that the prieſts of Otaheite, as well as elſewhere, take care to place themſelves a ſtep nearer the Deity than the common people, and to uſe the deceptions too frequently put in practice by ſuch mediators. While on board the Endeavour, he frequently prayed to his god *Tane* for a wind; and according to his own account never failed of ſucceſs. This, however, he took care to enſure; for he never began his prayers till he perceived the breeze already on the water, and ſo near that it muſt reach the ſhip before they could well be ended. It was obſerved likewiſe of the people of Otaheite, that they had their bards or minſtrels, who went about the country with muſical inſtruments. The band whom they ſaw at this time conſiſted of two players on flutes and three drummers; the latter accompanying the flutes with their voices. Their ſongs were made extempore, and the Engliſh themſelves were generally the ſubject.

11 Society Iſlands diſcovered.

From Otaheite our navigators ſailed towards a neighbouring iſland named *Tethuora;* but finding it ſmall, low, and without any ſettled inhabitants, the captain choſe rather to direct his courſe towards Huaheine and Ulietea, which he was informed were well inhabited. Theſe had never been viſited by any European ſhip; but the inhabitants, though peaceable and friendly, were very ſlow and cautious in trading, ſo that the captain was obliged to bring out his hatchets to market; a commodity which he had hoped might have been concealed from thoſe who had never ſeen an European ſhip before. On his arrival at Ulietea he found by the diſcourſe of Tupia, that the inhabitants of a neighbouring iſland named *Bolabola* were of ſuch a martial diſpoſition as to be the terror of thoſe of Huaheine, Ulietea, and others, inſomuch, that he apprehended great danger to our navigators ſhould they touch at an iſland which the Bolabola men had lately conquered. This, however, had ſo little effect upon Captain Cook, that he not only landed on the iſland already mentioned, but took poſſeſſion, in his majeſty's name, of Bolabola itſelf, together with Ulietea, Huaheine, and another named Otaha, which were all viſible at once.

12 Wretched appearance of the king of Bolabola.

During their ſtay here they paid a viſit to Opoony, the formidable monarch of Bolabola; whom, to their ſurpriſe, they found a feeble wretch, withered and decrepid, half blind with age, and ſo ſtupid that he ſeemed ſcarce to be poſſeſſed of a common degree of underſtanding. About theſe iſlands they ſpent ſix weeks, beſtowing upon them the name of the *Society Iſles*, on account of their being ſo near to each other. They are ſix in number, Ulietea, Huaheine, Bolabola, Otaha, Tubai, and Maurna. The ſmaller ones in their neighbourhood are Tethuora, Eimeo, Tapoamanoa, Oatara, Opururu, Tamou, Toahoatu, and Whennuaia.

13 Oheteroa iſland diſcovered.

Leaving the Society Iſlands, which are ſituated between Lat. 16. 10. and 16. 55. S. and between 150. 57. and 152. W. from the meridian of Greenwich, they fell in with the iſland of Oheteroa. ſituated in S. Lat. 22. 27. and W. Long. 150. 47.; but this was found to be deſtitute of any harbour or ſafe anchorage, and the diſpoſition of the inhabitants ſo hoſtile, that they could not by any means be conciliated, ſo that no attempts were made to land. From Tupia Captain Cook learned that there were ſeveral iſlands in the neighbourhood, which our navigator conjectured to be Boſcawen and Keppel's iſlands, diſcovered by Captain Wallis; but without ſpending more time in exploring theſe, he ſet ſail to the ſouthward in ſearch of a continent.

14 Comet of 1769 obſerved.

Our voyagers left Oheteroa on the 15th of Auguſt 1769, and on the 30th had a view of the comet which appeared that year; its tail ſubtending on an angle of 42 degrees. This proved a new ſource of apprehenſion to Tupia, who inſtantly cried out, that as ſoon as it was ſeen at Bolabola, the people of that country would attack thoſe of Ulietea, who would undoubtedly be obliged to fly with precipitation to the mountains to ſave their lives. On the 6th of October they diſcovered land, which from its ſize, and the enormous mountains obſervable on it, was ſuppoſed by the gentlemen on board to be part of *Terra Auſtralis incognita;* but, on farther examination it was found to be part of New Zealand.

15 They arrive at New Zealand.

Here the inhabitants were found to ſpeak a dialect of the language of Otaheite, ſo that they could underſtand Tupia, and he them; yet ſo extremely hoſtile were their diſpoſitions, that not the ſmalleſt intercourſe could be held with them; nor could any thing neceſſary for the ſhips be procured excepting wood; ſo that the name Captain Cook thought proper to beſtow on this part of the country was *Poverty Bay*. By the natives it is called *Taoneroa*, and lies in S. Lat. 38. 42. and W. Long. 181. 36. During the time of his ſtay in this part of the world, the captain circumnavigated almoſt the whole country of New Zealand, which he found to conſiſt of two iſlands ſeparated from each other by a narrow ſtrait, which, from its diſcoverer, has obtained the name of *Cook's Strait*. In ſome places the diſpoſition of the inhabitants was as favourable as could be wiſhed; ſo that Dr Solander, Mr Banks, and other gentlemen, had an opportunity of exploring the country in ſome degree, with a view to diſcover its natural productions.

16 Rock of an extraordinary ſhape.

In one of their excurſions, as they paſſed through a valley, the hills on each ſide of which were very ſteep, they were ſuddenly ſtruck with the ſight of a very extraordinary natural curioſity. It was a rock perforated through its whole ſubſtance, ſo as to form a rude but ſtupendous arch or cavern, opening directly to the ſea. This aperture was 75 feet long, 27 broad, and 45 in height, commanding a view of the bay and the hills on the other ſide, which were ſeen through it; and opening at once on the view, produced an effect far ſuperior to any of the contrivances of art.

17 Natural products of the country.

On that part of the coaſt, which, from having obſerved a tranſit of Mercury, they named *Mercury Bay*, oyſters were found in ſuch plenty, that they might have loaded not only their boats, but even their ſhip with them. They were about the ſame ſize with thoſe met with in this country; and on account of their being found in ſuch plenty, and likewiſe that the adjacent country abounds with conveniences, Captain Cook was at great pains to point out the ſituation of the place. By his obſervations, the latitude of Mercury Bay is 36. 48. 28. S.

Leaving this bay, our commander proceeded to explore other parts of the country, which by his account ſeems to abound with rivers. Two large ones were met with in Mercury bay; one of which, from the abundance of oyſters found at its mouth, was called *Oyſter river*; the other they named *Mangrove river*, from the number of mangrove trees growing there. A third, which they called *Thames*, was met with in that part called the Bay of Iſlands, up which they ſailed 14 miles. Its banks were everywhere adorned with lofty trees, which they had likewiſe obſerved in other parts of the country. They were too heavy for maſts, but would make the fineſt planks imaginable; and as they reſembled the pitch pine, the timber of which is lightened by tapping, the carpenter was of opinion that they might thus be rendered more proper for maſts than any European timber. One of theſe trees meaſured 19 feet 8 inches in circumference at the height of ſix feet from the ground, and was no leſs than 89, with very little taper, to the branches; ſo that the lieutenant ſuppoſed it muſt contain 356 feet of ſolid timber. In Queen Charlotte's Sound the country was little other than one vaſt foreſt, with plenty of excellent water, and the coaſt abounding with fiſh. As the ſhip lay at the diſtance of only a quarter of a mile from the ſhore, they were agreeably entertained with the ſinging of an infinite number of ſmall birds, which formed a melody greatly ſuperior to any thing they had ever heard before. The muſic of theſe little choriſters ſeemed to be like ſmall bells, moſt exquiſitely tuned, though probably the diſtance and intervention of the water had a conſiderable effect in heightening it. They began to ſing about two in the morning, and continued their ſong till ſunriſe, after which they were ſilent all the day, reſembling in this reſpect the nightingales of our own country.

18
General deſcription of the country.

The time which Captain Cook ſpent in exploring the coaſts of New Zealand was not leſs than ſix months. By his reſearches it was ſhown to conſiſt of two large iſlands, the moſt northerly of which is called *Eaheinomauwe*, and the moſt ſoutherly *Tovy* or *Tavai Poenammoo*; though it is not certain whether the whole ſouthern iſland or only a part of it is comprehended under this name. This iſland ſeems to be barren and mountainous, but *Eaheinomauwe* has a much better appearance; and it was univerſally believed by the gentlemen on board, that all kinds of European grain, as well as garden plants and fruits, would flouriſh in the greateſt abundance and perfection; and from the vegetables found here it was concluded that the winters are not more ſevere than thoſe of England, and it was known by experience, that the ſummer was not hotter, though the heat was more equal than in this country. Here are no quadrupeds except dogs and rats; and the latter are ſo ſcarce, that they eſcaped the notice of many on board. The birds are not numerous, and the gannet is the only one of the European kind that was obſerved. The inſects are equally ſcarce; but the ſea makes abundant recompenſe for this ſcarcity of land animals; every creek ſwarms with fiſh, equally delicious with thoſe in this country. The foreſts are of vaſt extent, and filled with excellent timber trees; the largeſt, ſtraighteſt, and cleaneſt that Mr Cook had ever ſeen. There is here one plant which anſwers the purpoſes of both hemp and flax, and excels all others of the kind that have been met with in any other part of the world. If the ſettling of New Zealand therefore ſhould ever be deemed an object worthy of the attention of Great Britain, Captain Cook was of opinion, that the beſt place for eſtabliſhing a colony would be either on the banks of the Thames or in the bay of Iſlands; each of theſe places having the advantage of an excellent harbour. Settlements might be extended, and a communication made with the inland parts of the country by means of the river; and veſſels eaſily conſtructed of the excellent timber with which the country everywhere abounds.

19
Proper place for ſettling a colony there.

20
Account of the inhabitants.

The inhabitants of New Zealand are in a very barbarous ſtate, and have a degree of ferocity unknown to the inhabitants of the South Sea iſlands, though they ſeem to have the ſame origin. During their reſidence there, our navigators had the moſt convincing evidences of their being cannibals, and accuſtomed to devour the bodies of their ſlain enemies. Notwithſtanding theſe barbarous practices, however, they ſeemed to enjoy a ſtate of uninterrupted health. In all the viſits made to their towns, none was ever perceived who had the leaſt bodily complaint, not even the ſlighteſt eruption on the ſkin. This extraordinary degree of health was likewiſe manifeſted by the eaſe with which their wounds were healed without the ſmalleſt application, as well as by the number of old men with which the iſland abounded. Many of theſe, by the loſs of their hair and teeth, ſeemed to be extremely old, but none of them were decrepid; and though inferior in ſtrength to the young men, they came not behind them in the leaſt with regard to cheerfulneſs and vivacity. The univerſal and only drink of the New Zealanders is water.

21
Diſcoveries at New Holland.

22
Magnetic needle ſurpriſingly affected.

Our navigator had now explored three-fourths of that part of the globe where the ſouthern continent was ſuppoſed to lie, without being able to find it; and his voyage had demonſtrated, that the lands ſeen by former navigators could not have been parts of ſuch a continent, though, as he had never proceeded farther to the ſouthward than 40 degrees, the arguments for it were not as yet entirely overthrown. Mr Cook, however, did not at this time proceed farther in the ſearch of ſuch a continent, but ſailed from New Zealand to the coaſt of New Holland, where he anchored in Botany Bay on the 20th of April. Here he found a few ſavage inhabitants more barbarous and degenerate than any that had yet been obſerved. Their language was harſh and diſſonant, totally unintelligible even to Tupia: they appeared to have little curioſity, and ſet no value upon any preſent that could be made them. The moſt remarkable circumſtance in this country ſeems to be its extreme ſcarcity of water; not a ſingle ſtream of any conſequence having ever been obſerved by any navigator. Some were of opinion indeed, that Moreton's bay, in S. Lat. 26. 59. and W. Long. 206. 28. opens into a river; though the only reaſon they had for this opinion was, that the ſea looked paler in that part than uſual, and the land at the bottom part of the bay could not be ſeen. At this time, however, the matter could not be determined by experiment, on account of the wind being contrary. The ſcarcity of water here is the more ſurpriſing, on account of the vaſt extent of the country, and likewiſe its having abundance of tolerably high hills. In this iſland there were found many curious plants and animals; and it was found, that in ſeveral places the magnetical needle was affected to ſuch a degree, as to vary its poſition even to 30 degrees. At one time it varied no leſs

than

Cook's Diſcoveries.

than two points on being removed to the diſtance of only 14 feet. Some of the looſe ſtones being taken up and applied to the needle produced no effect; but Mr Cook was of opinion that the whole phenomenon was to be aſcribed to iron ore in ſome of the mountains, and of which traces had been already met with. This irregularity continued in ſome degree even at ſea; for when the ſhip was cloſe under Cape Upſtart, the variation of the needle in the evening of the 4th of June was 9° eaſt, and next morning only 5° 35′; and this was in like manner accounted for from iron ore, or ſome magnetical matter below the ſurface of the ground. The great iſland has many other ſmall ones round it, ſeveral of which were viſited by our navigators. 23 Birds neſts of an immenſe ſize. One of them, named *Eagle Iſland*, ſeemed to be inhabited by a monſtrous kind of birds, the neſt of one of which meaſured no leſs than 26 feet in circumference, and two feet eight inches in height; and in the Philoſophical Tranſactions, vol. xx. there is an account of one of theſe neſts ſtill larger; but the bird to which it belonged was not ſeen. That which our navigators ſaw was built of ſticks, and lay upon the ground.

24 Vaſt extent of the country.

The country which goes by the name of *New Holland* is by far the largeſt iſland in the world. Its eaſtern part, called *New South Wales*, now firſt explored by Captain Cook, extends upwards of 2000 miles in length, if the coaſt were reduced to a ſtraight line. Though inhabited, as we have already ſaid, by very barbarous ſavages, their number appears to bear no proportion to the extent of their territory. The intercourſe they had with our navigators was ſo ſmall, that they could pick up but a few words of their language. As a Britiſh ſettlement is now made in that country, there is no doubt that much more exact accounts will ſoon be obtained than even the diligence and attention of Captain Cook could collect on ſuch a tranſient viſit.

25 Separated by ſtraits from New Guinea.

In this voyage our navigator, beſides exploring the eaſtern part of the iſland, which had never been done before, diſcovered that it was ſeparated from the iſland of New Guinea, to which it had formerly been thought to join. The two countries are ſeparated by a ſtrait to which the commander gave the name of *Endeavour Strait*. The north entrance of this lies in S. Lat. 10. 39. and W. Long. 218. 36.; the paſſage is formed by the main land and a congeries of iſlands to the north, on which our navigator beſtowed the name of *Prince of Wales's Iſlands*. Theſe are very different both in height and extent; and the captain was of opinion, that ſeveral paſſages might be found out among them. 26 Cockles of vaſt ſize, ſea-ſcum, &c. On the coaſt of New Holland oppoſite to New Guinea are found cockles of an immenſe ſize; ſome of them being as much as two men could move, and containing 20 pounds of good meat. In theſe ſeas, as well as on the coaſts of Brazil, our navigators found the ſurface of the water covered with a kind of ſcum called by the ſailors *ſea-ſpawn*. It was examined by Mr Banks and Dr Solander; but they could determine nothing farther than that it was of vegetable origin.

The natives of New Guinea were ſo hoſtile that no diſcoveries of any conſequence could be made. They reſembled the New Hollanders in ſtature, and having ſhort cropped hair. Like them too they were abſolutely naked, but ſomewhat leſs black and dirty. They had a ſurpriſing method of letting off a kind of fires, exactly reſembling the flaſhes of fire-arms, but without any exploſion. It was not known in what manner this was done, as they were never near enough to make a particular obſervation. Thoſe who diſcharged them had a ſhort piece of ſtick which they ſwung ſidewiſe from them, from which there iſſued the fire and ſmoke juſt mentioned. This ſeems to have been intended as a defiance; for they had no effect as offenſive weapons, and others were armed with bows and arrows. The country appeared extremely pleaſant and fertile. The place at which they touched lies in S. Lat. 6. 15.

27 Unaccountable method of th natives of letting of fires.

As the condition of the Endeavour was now very much ſhattered by having ſailed ſo long in theſe dangerous ſeas, the commander determined to make the beſt of his way for Batavia in order to refit. In this voyage he firſt paſſed two unknown iſlands without touching at either of them. They were ſuppoſed to belong to the Aurora iſlands; but if this be the caſe, the latter muſt be laid down at too great a diſtance from New Guinea. The Weaſel Iſles, laid down by former navigators at about 28 or 25 leagues from the coaſt of New Holland, were not ſeen; for which reaſon Mr Cook is of opinion that they are erroneouſly laid down.

Paſſing by the iſlands of Timor, Timor-lavet, Rotta, and Seman, they next arrived at the iſland of Savu, where a ſettlement had lately been made by the Dutch. 28 Aurora auſtralis. In this voyage they had the ſatisfaction of obſerving the aurora auſtralis, which here ſeemed to differ in ſome reſpects from that in the northern hemiſphere. It conſiſted of a dull reddiſh light extending about 20 degrees above the horizon; and though it varied ſometimes in extent, it was never leſs than eight or ten degrees. From this general maſs of light there ſometimes iſſued rays of a brighter colour, which vaniſhed and were renewed like thoſe of the aurora borealis, but without any of that tumultuous motion obſerved in the aurora borealis. The body of the light bore S. S. E. from the ſhip, and continued without any diminution of its brightneſs from 10 to 12 at night.

29 Excellent character of the inhabitants of Savu.

The middle part of the iſland of Savu lies in 10. 35. ſouth, and 237. 30. weſt longitude, and afforded a moſt beautiful proſpect from the ſhip. The people are remarkable for the purity of their morals, which are ſaid to be irreproachable, even on the principles of Chriſtianity. Though no man is allowed to have more than one wife, inſtances of illicit commerce betwixt the ſexes are ſcarcely known among them. Inſtances of theft are likewiſe very rare; and ſo far are they from revenging a ſuppoſed injury by murder, that when any differences ariſe among them, they are immediately and implicitly referred to the determination of the king. They will not even make it the ſubject of private debate, leſt they ſhould be provoked to reſentment and ill-nature; and the delicacy and cleanlineſs of their perſons are ſaid to be proportionable to the purity of their morals.

30 Good effects of tl electrical chains in preſerving rom the effects of lightning.

On the arrival of the Endeavour at Batavia, our navigator had an opportunity of obſerving the good effects of the electrical chains applied to ſhips, in ſecuring them from the effects of lightning. A dreadful ſtorm of thunder happened one evening, during which the main-maſt main-maſt of one of the Dutch Eaſt Indiamen was ſplit and carried away cloſe by the deck, the main-top-maſt, and top-gallant-maſt being ſhivered to pieces. This ſhip lay ſo near the Endeavour, that the latter would probably have ſhared the ſame fate, had it not been for the conducting chain which fortunately was juſt put up. The exploſion ſhook her like an earthquake, the chain at the ſame time appearing like a line of fire. The ſtroke ſeemed to have been directed to the Dutch veſſel by an iron ſpindle at the maſt head: which practice our commander diſcommends, but ſtrongly inculcates the uſe of the electrical chain.

31 Death of Tupia.

On their landing at Batavia, Tupia was confined by ſickneſs, ſo that he appeared quite lifeleſs and dejected when put into the boat: but on his arrival at land recovered his ſpirits ſurpriſingly. The ſcene, to him ſo new and extraordinary, ſeemed to produce an effect ſimilar to what is produced by enchantment. His attention was particularly engaged by the various dreſſes of the people: and being informed that at Batavia every one appeared in the dreſs of his own country, he expreſſed a deſire of likewiſe appearing in the garb of Otaheite. Having therefore been furniſhed with South ſea cloth from the ſhip, he equipped himſelf with great quickneſs and dexterity. After the firſt flow of ſpirits had ſubſided, however, he ſoon began to feel the fatal effects of the climate; and his boy Tayeto, whoſe ſpirits had been ſtill more elevated on his arrival, was attacked with an inflammation of the lungs, and in a little time fell a victim to the diſeaſe. Tupia himſelf did not long ſurvive him, and his death was not attributed ſolely to the unwholeſomeneſs of the climate. Having been accuſtomed from his infancy to ſubſiſt chiefly upon vegetable food, and particularly on ripe fruit, he had ſoon contracted the diſorders incident to a ſea life, and could ſcarce have been expected to reach England, even if the unwholeſome climate of Batavia had been out of the queſtion.

32 Prince's Iſland, a proper place for ſhips to touch at.

The Endeavour left Batavia on the 27th of December 1770, and on the 5th of January 1771 reached Prince's iſland. This place had been formerly much frequented by the India ſhips, but of late entirely deſerted on account of the ſuppoſed bad quality of the water; but this our navigator has diſcovered to be a miſtake: and that, though the water near the ſea is brackiſh, it may be had of excellent quality by going a little way up the country. He is of opinion, that this iſland is a more proper place for ſhips to touch at than either North Iſland or New Bay, becauſe neither of theſe can afford other refreſhments, which may be had at Prince's iſland.

The reſt of the voyage affords but little intereſting matter. The Cape of Good Hope, which was their next ſtage, has been ſo fully deſcribed by former navigators that there was little room for addition. At St Helena the commander made ſome remarks on the rigorous treatment of the ſlaves, which was repreſented as worſe than that of the Dutch either at Batavia or the Cape of Good Hope. In the account of his ſecond voyage, however, this accuſation was retracted.

33 Second voyage.

Captain Cook's ſecond voyage was undertaken in an eſpecial manner to determine finally the queſtion concerning the exiſtence of a ſouthern continent. It commenced in the year 1772; and, as in the former, he proceeded firſt to Madeira. From thence he proceeded to St Jago, one of the Cape de Verde iſlands; where an opportunity was taken of delineating and giving ſuch a deſcription of Port Praya, and the ſupplies to be there obtained, as might be of uſe to future navigators. On the 8th of September he croſſed the line in 8° weſt longitude, and had the ſatisfaction to meet with good weather, though he had been informed that he had ſailed at an improper time of the year, in conſequence of which he would probably be becalmed. From his account, however, it appears, that though in ſome years ſuch weather may be expected, it is by no means univerſally the caſe. In this part of the ocean he had alſo an opportunity of obſerving the cauſe of the luminous property of ſea-water, which in his former voyage had been attributed to inſects. Mr Forſter being of a different opinion, the matter was again particularly inquired into, but the reſult was entirely conformable to the former determination. Some buckets of water being drawn up from alongſide the ſhip, were found to be filled with thoſe inſects of a globular form, and about the ſize of a ſmall pin's head. No life indeed could be perceived in them; but Mr Forſter was thoroughly convinced of their being living animals when in their proper element.

34 Calms not always to be feared near the equinoctial.

35 Luminous quality of ſea water further determined.

36 Ice iſlands.

Proceeding ſouthward in queſt of a continent, they fell in with ice iſlands in S. Lat. 50. 40. and two degrees of longitude eaſt from the Cape of Good Hope. One of theſe was ſo much concealed by the hazineſs of the weather, that it could not be ſeen at the diſtance of more than a mile. Captain Cook judged it to be about 50 feet in height and half a mile in circumference; its ſides riſing in a perpendicular direction, and the ſea-breaking againſt them with great violence. Two days after, they paſſed ſix others, ſome of which were two miles in circumference and 60 feet in height; yet ſuch was the ſtrength and violence of the waves that the ſea broke quite over them. On the 14th they were ſtopped by a vaſt field of low ice, of which they could perceive no end. In different parts of this field there were ſeen iſlands, or hills of ice like thoſe already deſcribed, and ſome of the people imagined that they ſaw land over them; but upon a narrow examination this was found to be a miſtake. On getting clear of the field of ice they again fell in with looſe iſlands; and as it was a general opinion that theſe are only formed in bays and rivers, our navigators concluded that they could not be at a great diſtance from land. They were now in the latitude of 55° 40′ ſouth; and as they had ſailed for more than 30 leagues along the edge of the ice without finding any opening, the captain determined to run 30 or 40 leagues farther to the eaſtward, in hopes of then getting to the ſouthward. If in this attempt he met with no land or other impediment, his deſign was to ſtretch behind the ice altogether, and thus determine the matter at once. In a ſhort time, however, it became evident that the field of ice along which they had ſailed ſo long, did not join with any land; and the captain now came to a reſolution of running as far to the weſt as the meridian of Cape Circumciſion. In the proſecution of this deſign he met with a very ſevere ſtorm, which was rendered the more dangerous by the pieces of looſe ice among which they were ſtill entangled, and a vaſt field of which they could not perceive the boundaries about three miles to the northward. Of this they could not get clear without receiving ſome ſevere ſtrokes; and after all, when they arrived at the place where they ought to have found Cape Circumciſion, it could not be diſcovered; ſo that the captain concluded that what Bouvet took for land could have been nothing but ice.

37
Ice not always found in the vicinity of land.

During this run the fallacy of the general opinion had been diſcovered, that the ice with which the polar regions abound has been formed in the vicinity of land. It was found likewiſe, that the water produced from the melting of ice, even though formed in the ocean, was perfectly ſweet and well taſted. Of this circumſtance the captain took advantage to ſupply himſelf with water; and gave it as his opinion that it was the moſt expeditious method of watering he had ever known. He had likewiſe an opportunity of detecting another popular error, viz. that penguins, albatroſſes, and other birds of that kind, never go far from land. This indeed may be the caſe in open ſeas, but in ſuch as are covered with ice it is very different; for they then inhabit the ice iſlands, and float out with them to ſea to a great diſtance.

38
Irregularity of the magnetic needle.

When in the latitude of 49. 13. S. ſome ſigns of land were perceived; but as the wind did not admit of any ſearch being made in the direction where it was ſuppoſed to lie, the captain proceeded in his voyage to the eaſtward. A very remarkable alteration in the direction of the needle was now perceived, and which could not be ſuppoſed owing to the vicinity of any magnetic matter, as it happened while the ſhips were far out at ſea. The circumſtance was, that when the ſun was on the ſtarboard ſide of the ſhip the variation was leaſt, but greateſt when on the oppoſite ſide. An aurora auſtralis was again obſerved, which broke out in ſpiral or circular rays, and had a beautiful appearance; but did not ſeem to have any particular direction, being conſpicuous at various times in different parts of the heavens, and diffuſing its light over the whole atmoſphere.

39
Extreme cold of the ſouthern ſeas.

40
Further account of New Zealand.

The extreme cold and ſtormy weather which now began to take place, determined Captain Cook not to croſs the antarctic circle a ſecond time as he had once deſigned. His obſervations confirmed the accounts of former navigators, that the cold of the ſouthern ſeas is much more intenſe than in equal latitudes in the northern hemiſphere; but at the ſame time it ſhowed that this cold cannot be owing to the vicinity of a continent, as had been formerly imagined. On the contrary, it was now determined beyond diſpute, that if any ſuch continent exiſted in the eaſtern part of the ſouthern ocean, it muſt be confined within the latitude of 60 degrees. No farther diſcoveries therefore being practicable in higher latitudes, as the winter ſeaſon was approaching, the commander ſteered for New Zealand, where he anchored in Duſky Bay on the 25th of March, having been at ſea 117 days without once coming in ſight of land. Here the time was ſpent in procuring proper refreſhments for the people, and exploring the ſea-coaſt and country for the benefit of future navigators. Nor was our commander unmindful of the inhabitants. Here he left the five geeſe which yet remained, chooſing for them a place where there were no people at the time to diſturb them; and as they had there great plenty of food, he had no doubt of their breeding, and in a ſhort time ſpreading over the country. Some days after a piece of ground was cleared by ſetting fire to the topwood, after which it was dug up and ſowed with garden ſeeds. Duſky Bay is ſituated in the weſtern iſland of New Zealand, called *Tavai Poenammoo*, which, as has already been ſaid, is leſs fertile than the other. The inland part is full of rugged mountains of a vaſt height: but the ſea-coaſt is covered with trees, among which is the true ſpruce, which was found to be of great uſe. It was remarked, that though a vaſt quantity of rain fell during the time of reſidence here, it was not attended with any bad effects on the health of the people: which furniſhes an additional argument for the healthineſs of the place. Duſky Bay is reckoned by Captain Cook to be the moſt proper place in New Zealand for the procuring of refreſhments, though it is attended with ſome diſagreeable circumſtances, particularly being infeſted with great numbers of black ſand-flies, which were troubleſome to an extreme degree. The natives ſeen at Duſky Bay were apparently of the ſame race with thoſe ſeen in other parts of the country, and led a wandering life, without any appearance of being united in the bonds of ſociety or friendſhip.

41
Water ſpouts.

From Duſky Bay the captain proceeded to Queen Charlotte's Sound, where he met with the Adventure, which had been ſeparated from the Reſolution for above 14 weeks. In his paſſage thither he had an opportunity of obſerving ſix water-ſpouts, one of which paſſed within 50 yards of the Reſolution. It has been a common opinion, that theſe meteors are diſſipated by the firing of a gun, and the captain was ſorry he had not made the experiment; but he acknowledges, that though he had a gun ready for the purpoſe, and was near enough, his attention was ſo much engaged in viewing them, that he forgot to give the neceſſary orders.

42
Diſcoveries of Captain Furneaux.

Having planted another garden in this part of the country, and left two goats, two breeding ſows and a boar, in as private a ſituation as poſſible, that they might be for ſome time out of the reach of the natives, the captain ſet ſail for Otaheite. During the long abſence of the Adventure, Captain Furneaux had viſited the coaſt of New Holland, and diſcovered that there was no probability of Van Diemen's land being ſeparated from it by ſtraits: he had likewiſe found additional proofs that the natives of New Zealand were accuſtomed to eat human fleſh. Captain Cook alſo remarked with concern, that the morals of the New Zealanders were by no means mended by the viſit he had formerly paid them. At that time he looked upon the women to be more chaſte than thoſe of moſt of the nations he had viſited; but now they were ready to proſtitute themſelves for a ſpikenail, and the men to force them to ſuch an infamous traffic, whether agreeable to the inclinations of the females or not.

In the run from New Zealand to Otaheite, our commander paſſed very near the ſituation aſſigned by Captain Carteret to Pitcairn's iſland, diſcovered by him in 1767, but without being able to find it, though a ſight of it would have been uſeful for correcting its longitude as well as that of others in the neighbourhood;

43 New iſlands diſcovered

hood; but there was not at preſent any time to ſpend in ſearching for it. Proceeding farther on in his voyage, however, he fell in with a cluſter of iſlands ſuppoſed to be thoſe diſcovered by M. Bougainville; and named by him the *Dangerous Archipelago*. To four of theſe Captain Cook gave the names of *Reſolution*, *Doubtful*, *Furneaux*, and *Adventure Iſlands*. Reſolution Iſland is ſituated in S. Lat. 17. 24. W. Long. 141. 39. Doubtful Iſland in S. Lat. 17. 20. W. Long. 141. 38. Furneaux Iſland in S. Lat. 17. 5. W. Long. 143. 16. and Adventure Iſland in S. Lat. 17. 14. and W. Long. 144. 30.

44 Miſtake concerning the women of Otaheite.

No diſcovery of any great conſequence was made at the iſland of Otaheite or thoſe in its neighbourhood, excepting that the captain had an opportunity of correcting the opinion, which till now had prevailed, of the exceſſive diſſoluteneſs and immodeſty of the women of Otaheite; and which had been enlarged upon by Dr Hawkeſworth more than ſeemed to be conſiſtent with decency. The charge, however, according to the accounts of this ſecond voyage, is far from being indiſcriminately true, even of the unmarried females of the lower claſs. Some additions were made to the knowledge of the geography of thoſe iſlands; and from Huaheine Captain Furneaux took on board of his ſhip one of the natives of Ulietea named *Omai*, afterwards ſo much ſpoken of in England. Captain Cook at firſt appeared diſſatisfied with his choice of this youth, as being inferior in rank to many others, and having no particular advantage in ſhape, figure, or complexion; however, he had afterwards reaſon to be better pleaſed. During the captain's reſidence at Otaheite, he uſed his utmoſt endeavours to diſcover whether the venereal diſeaſe was endemic among them, or whether it had been imported by Europeans; but in this he could not meet with any perfectly ſatisfactory account, though it was univerſally agreed, that if it had been introduced by Europeans, it muſt have been by the French under M. Bougainville.

45 Harvey's iſland diſcovered.

Captain Cook having left Ulietea on the 17th of September 1773, directed his courſe weſtward, with an inclination to the ſouth. In this courſe he diſcovered land in S. Lat. 19. 8. and W. Long. 158. 54. to which he gave the name of *Harvey's Iſland*. From thence he proceeded to the iſland of Middleburg, where he was treated in the moſt hoſpitable manner poſſible. To ſuch an exceſs did the people carry their generoſity, that they ſeemed to be more fond of giving away their goods than in receiving any thing for them; inſomuch that many, who had not an opportunity of coming near the boats, threw over the heads of others whole bales of cloth, and then retired, without either waiting or aſking for any thing in return. From Middleburg he proceeded to Amſterdam iſland, where the beauty and cultivation of the iſland afforded the moſt enchanting proſpect. There was not an inch of waſte ground; the roads were no wider than what was abſolutely neceſſary, and the fences not above four inches thick. Even this was not abſolutely loſt; for many of theſe contained uſeful trees or plants.

46 South ſea iſlands generally ſurrounded with coral rocks.

It is obſervable of the iſles of Middleburg and Amſterdam, as well as of moſt others in the South ſea, that they are guarded from the waves by a reef of coral rocks, which extend about one hundred fathoms from the ſhore. Thus they are effectually ſecured from the encroachments of the ocean; by which they would probably ſoon be ſwallowed up, as moſt of them are mere points in compariſon of the vaſt quantity of water which ſurrounds them. Here he left a quantity of garden vegetable ſeeds and pulſe, which it was not doubted would be taken care of by the induſtrious inhabitants. In the laſt mentioned iſlands our navigators found no animals but hogs and fowls; the former being of the ſame kind with thoſe uſually ſeen in the other iſlands of the South ſea; but the latter greatly preferable, equalling thoſe of Europe in their ſize, and even preferable in reſpect of the goodneſs of their fleſh.

47 Another viſit to New Zealand.

On the 7th of October, Captain Cook left the iſland of Amſterdam, with a deſign to pay another viſit to New Zealand, in order to take in wood and water for his voyage in queſt of a ſouthern continent. The day after he left Amſterdam he fell in with the iſland of Pilſtart, formerly diſcovered by Taſman, and ſituated in S. Lat. 26'. W. Long. 175. 59. thirty-two leagues diſtant from the eaſt end of Middleburg. On his arrival at New Zealand, he exerted himſelf as much as poſſible to leave a proper aſſortment of vegetables and animals for the benefit of the inhabitants. One of the firſt things he did, therefore, was to make a preſent to a chief, who had come off in a canoe, of a quantity of the moſt uſeful garden ſeeds, ſuch as cabbage, turnips, onions, carrots, parſneps, and yams; together with ſome wheat, French and kidney beans, and peaſe. With the ſame perſon alſo he left two boars, two ſows, four hens, and two cocks. This preſent, however valuable in itſelf, ſeems to have been but indifferently received; for the chief was much better ſatisfied with a ſpikenail half the length of his arm than with all the reſt; notwithſtanding which, he promiſed to take care of the ſeeds, and not to kill any of the animals. On inquiring about thoſe animals left in the country in the former part of his voyage, the captain was informed, that the boar and one of the ſows had been ſeparated, but not killed. The other he ſaw in good condition, and very tame. The two goats, he was informed, had been killed by a native of the name of Gaubiah. The gardens had met with a better fate; all the articles being in a very flouriſhing condition, though left entirely to nature, excepting the potatoes. Captain Cook, however, ſtill determined to ſupply theſe iſlanders with uſeful animals, put on ſhore a boar, a young ſow, two cocks, and two hens, which he made a preſent of to the adjacent inhabitants. Three other ſows and a boar, with two cocks and hens, he ordered to be left in the country without the knowledge of the Indians. They were carried a little way into the woods, and there left with as much food as would ſerve them for 10 or 12 days, in order to prevent them from coming down to the coaſt in queſt of it, and thus being diſcovered.

48 Voyage in queſt of a ſouthern continent.

A ſecond ſeparation from the Adventure had now taken place; notwithſtanding which, Captain Cook ſet out alone with his veſſel in queſt of a ſouthern continent; and ſuch was the confidence put in him by the ſailors, that all of them expreſſed as much ſatisfaction and alacrity as if not only the Adventure, but ever ſo many ſhips had been in company.

On the 26th of November the captain ſet ſail from New Zealand; and on the 12th of December began to

49 Is ſtopped by ice.

fall in with the ice, but conſiderably farther to the ſouthward than they had met with it in the former part of his voyage; being now in the Lat. of 62. 10. S. and 172° W. Long. As they proceeded ſouthward, the number of ice iſlands increaſed prodigiouſly; and in Lat. 67. 31. and W. Long. 142. 54. they all at once got in among ſuch a cluſter of theſe iſlands, that it became a matter of the utmoſt difficulty and danger to keep clear of them. Finding it impoſſible, therefore, to get any farther to the ſouthward at preſent, the captain determined to explore a conſiderable tract of ſea to the north of his preſent ſituation, and then again to ſtand to the ſouth. But in this he was ſtill unſucceſsful; no land being diſcovered either in ſailing northward, eaſtward, weſtward, or ſouthward; though he proceeded as far in the laſt direction as 71. 10. S. Lat. and 106. 54. W. It was now impoſſible to proceed; and the opinion of the captain himſelf, as well as moſt of the gentlemen on board, was that the ice by which they were now ſtopped extended as far as the pole. As there was ſtill room, however, in parts of the ocean entirely unexplored, for very large iſlands, our commander determined not to abandon the purſuit in which he was engaged until there ſhould not be any poſſibility of doing more: and beſides the poſſibility of making new diſcoveries, he was conſcious that many of the iſlands already diſcovered were ſo obſcurely known, that it was of conſequence to pay them a ſecond viſit. With this view he propoſed to go in queſt of Eaſter or Davis's iſland; the ſituation of which was known with ſo little certainty, that none of the attempts lately made to diſcover it had been ſucceſsful. He next intended to get within the tropic, and then to proceed to the weſt, touching at any iſlands he might meet with, and ſettling their ſituations, until he ſhould arrive at Otaheite, where it was neceſſary for him to make ſome ſtay in order to look for the Adventure. It was part of his deſign alſo to run to the eaſtward as far as Terra Auſtral del Eſpiritu Santo, diſcovered by Quiros, and which M. Bougainville had named *The Great Cyclades*. From this land he propoſed to ſail to the ſouthward, and from thence to the eaſt between the latitude of 50° and 60°. In the execution of this deſign, he determined if poſſible to reach Cape Horn, during the enſuing November, when he would have the beſt part of the ſummer before him to explore the ſouthern part of the Atlantic ocean.

50 Nutritive property of dog's fleſh.

51 Viſit Eaſter iſland,

In purſuing his courſe to the northward, it had been part of his deſign to find out the land ſaid to have been diſcovered by Juan Fernandez in about the latitude of 38°; but he was ſoon convinced, that if any ſuch land exiſted, it could only be a very ſmall iſland; but the proſecution of the deſign was for ſome little time interrupted by a violent bilious diſorder by which the captain was attacked. In this, when he began to recover, as there was no freſh meat on board, he was obliged to have recourſe to dog's fleſh; and a favourite animal belonging to Mr Forſter was ſacrificed on the occaſion. The captain was able to eat not only of the broth made of this, but likewiſe of the fleſh, when his ſtomach could bear nothing elſe. On the 11th of March they arrived at Eaſter iſland, before which time the captain was tolerably recovered. Here they made but few diſcoveries farther than determining the ſituation of it to be in S. Lat. 27. 5. 30. and W. Long. 109. 46. 20. The iſland itſelf was found barren and deſolate, having every appearance of being lately ruined by a volcanic eruption; without either wood, fuel, or freſh water worth taking on board. The inhabitants were few in number; and the women in very ſmall proportion to the men, but remarkable for their lewdneſs. A number of gigantic ſtatues were obſerved, which had alſo been taken notice of by Commodore Roggewein, and the origin of which could not be accounted for.

52 and the Marqueſas.

On leaving Eaſter iſland, Captain Cook was again attacked by his bilious diſorder; but happily recovered before he reached the Marqueſas, which they did on the 6th and 7th of April. One of theſe, being a new diſcovery, received the name of *Hood's Iſland*, from the young gentleman by whom it was firſt obſerved. Theſe are five in number; ſituated between 9 and 10 degrees of ſouth latitude, and between 138. 47. and 139. 13. of weſt longitude. They were diſcovered by Mendana a Spaniard; and their names are, La Magdalena, St Pedro, La Dominica, Santa Chriſtina, and Hood's Iſland. The inhabitants are, without exception, the fineſt race of people in the South ſea, ſurpaſſing all others in that part of the world in the ſymmetry of their perſons and regularity of their features. Their origin, however, from the affinity of language, was evidently the ſame with that of Otaheite. It was in St Chriſtina that our commander anchored; and he has left particular directions for finding a particular cove in Reſolution bay in that iſland, which is the moſt convenient for procuring wood and water.

53 Iſland Tiookea.

54 Palliſer's iſlands.

In the paſſage from the Marqueſas to Otaheite, our navigators paſſed ſeveral low and ſmall iſlands connected together by reefs of coral rocks. One of theſe, named by the inhabitants *Tiookea*, was viſited by Lieutenant Cooper. It was diſcovered and viſited by Captain Byron; and is ſituated in S. Lat. 27. 30. W. Long. 144. 56. The inhabitants are much darker in their complexions, and ſeem to be of a fiercer diſpoſition than thoſe of the neighbouring iſlands. They have the figure of a fiſh marked upon their bodies; a very proper emblem of their profeſſion, deriving their ſubſiſtence almoſt entirely from the ſea. Paſſing by St George's iſlands, which had been alſo diſcovered and named by Captain Byron, our commander now diſcovered four others, which he named *Palliſer's Iſlands*. One of theſe is ſituated in S. Lat. 15. 26. and W. Long. 146. 20. another in S. Lat. 15. 27. and W. Long. 146. 3. They were inhabited by people reſembling thoſe of Tiookea, and like them were armed with long pikes. Here our navigator obſerves, that from W. Long. 138° to 148° or 150°, the ſea is ſo full of ſmall low iſlands, that one cannot proceed with too much caution.

55 Arrival at Otaheite.

On his arrival in Otaheite, proviſions were met with in great plenty; and they were now very acceptable, by reaſon of the long time the ſhip had been at ſea without obtaining any conſiderable ſupply. Two goats which had been given by Captain Furneaux to a chief named *Otoo*, appeared to be in a very promiſing ſituation. The female had brought forth two kids, which were almoſt large enough to propagate; and as ſhe was again with kid, there was little doubt that the iſland

Cook's Diſcoveries.

iſland would ſoon be ſtocked with theſe uſeful animals; though it was otherwiſe with the ſheep, all of which had died except one. On this occaſion, alſo, the captain furniſhed the natives with cats, of which he gave away twenty; ſo that there was little danger of the ſtock of theſe animals decaying. During his reſidence at this time, he had an opportunity of making ſome computation of the number of inhabitants on the iſland, which he ſuppoſed to be no leſs than 200,000.

56 Huaheine, Ulietea, Howe ſland, &c.

Huaheine and Ulietea iſlands were next viſited, but without any remarkable occurrence. From the latter our commander ſet ſail on the 5th of June 1774; and next day came in ſight of Howe iſland, diſcovered by Captain Wallis, and ſituated in S. Lat. 16. 46. and W. Long. 154. 8. On the 16th a new iſland, named *Palmerſtone Iſland*, was diſcovered, in S. Lat. 18. 4. W. Long. 163. 10.; and four days after, another was obſerved in S. Lat. 19. 1. W. Long. 169. 37. As it was evidently inhabited, the captain determined to land; but found the people ſo extremely hoſtile, that no intercourſe could be had: nay, he himſelf was in danger of loſing his life by a lance thrown by one of the natives, which paſſed cloſe over his ſhoulder. From the extreme hoſtility of the people of this iſland, it was named by Captain Cook *Savage Iſland*. It is of a round ſhape, pretty high, and has deep water cloſe to the ſhore, but has no good harbour.

57 Rotterdam ſland.

Paſſing by a number of ſmall iſlands, Captain Cook next anchored at that of Anamocka or Rotterdam, diſcovered by Taſman. It is ſituated in 20. 15. S. Lat. and 174. 31. W. Long. Its form is triangular, each ſide extending about three and a half or four miles. From the north-weſt to the ſouth it is encompaſſed by a number of ſmall iſlands, ſand banks, and breakers; of which no end can be ſeen from the iſland on the northern ſide, and may poſſibly be as far extended as Amſterdam or Tongataboo. While the captain remained on this iſland, he learned the names of more than 20 of the adjacent iſles, ſome of which were in ſight between the north-weſt and north-eaſt. Two of theſe, which lie more to the eaſtward than the others, are named *Amattafoa* and *Oghoo*. 58 Suppoſed volcano. They are remarkable for their height; and from a great ſmoke viſible about the middle of Amattafoa, it was ſuppoſed to have a volcano. The iſland of Rotterdam, Middleburg, or Eaoowe, with Pilſtart, form a group extending about three degrees of longitude, and two of latitude. The whole group was named *The Friendly Iſles* by Captain Cook, on account of the friendſhip which ſeemed to ſubſiſt among the inhabitants, and their courteous behaviour to ſtrangers. The people of Rotterdam iſland are ſimilar to thoſe of Amſterdam; but the iſland is not in ſuch a high ſtate of cultivation as Amſterdam, nor do its fruits come to ſuch perfection. It is alſo inferior in the articles of cloth, matting, &c. which are accounted the wealth of theſe parts.

59 New Hebrides viſit de

From Rotterdam iſland our navigator continued his courſe to the weſtward, where he firſt diſcovered a ſmall iſland in S. Lat. 19. 48. W. Long. 178. 2. It was named Turtle iſland, from the great number of theſe animals found upon it. Sixteen days after he fell in with the cluſter of iſlands named by M. Bougainville the *Great Cyclades*. The firſt iſland on which he landed was Mallicollo, where, though the people were at firſt very hoſtile, they were ſoon conciliated, and a friendly intercourſe took place. The language of theſe people is conſiderably different from that of the other South ſea iſlands; they are diminutive in their perſons, and of ugly features; their hair black or brown, ſhort and curling, but leſs ſoft than that of the negroes. They had no name for a dog in their language, and had never ſeen the animal; ſo that they were extremely fond of a dog and bitch, of which Captain Cook made them a preſent. The harbour in this iſland, in which the ſhip came to an anchor, was named Sandwich harbour, and lies on the north-eaſt ſide, in S. Lat. 16. 25. 20. E. Long. 167. 57. 53. It is very commodious for the carrying on any operations at land, having a good depth of water, and many other advantages.

60 Shepherd's iſles.

The next diſcovery was that of the group named *Shepherd's Iſles*, in honour of Dr Shepherd, Plumian profeſſor of aſtronomy at Oxford. Numbers more were every day obſerved; of which one peaked rock, named the *Monument*, was uninhabited, being apparently inacceſſible to any other creature but birds. Sandwich iſland is of a conſiderable extent, and exhibits a moſt beautiful proſpect. It is ſurrounded with other ſmaller iſlands, the principal of which were named *Montague* and *Hinchinbrooke*. At Erromango they found the people hoſtile and treacherous; and from a ſkirmiſh they had with them near a promontory on the north-eaſt point of the iſland it was named *Traitor's Head*. Its ſituation is in S. Lat. 10. 43. E. Long. 169. 28.

61 Tanna iſland.

From Erromango our navigators proceeded to Tanna, an iſland they had formerly diſcovered at a diſtance, and which is ſurrounded by ſome others, three of which are named *Immer*, *Footoona* or *Erronan*, and *Anatom*. At Tanna they ſtaid for ſome time, on account of their wanting ſome quantity of wood. 62 Volcano. A volcano was ſeen about the middle of this iſland, which burned with great violence, particularly in moiſt and wet weather; but notwithſtanding the friendly terms on which they were with the natives, the latter would never allow them to approach this mountain. There were ſome ſpots on the ſea-coaſt which emitted a hot and ſulphureous ſmoke; and the people alſo expreſſed much uneaſineſs when theſe were approached or meddled with. The port which the ſhip entered in this iſland was named *Reſolution Harbour*, and is ſituated in S. Lat. 19. 32. 25½. E. Long. 169. 44. 35. It is a ſmall creek three quarters of a mile long, and about half as broad. It is extremely convenient, having plenty of wood and water cloſe to the ſhore. Among the vegetable productions of this iſland, there is reaſon to ſuſpect the nutmeg tree to be one, a pigeon having been ſhot, in the craw of which was a wild nutmeg. The inhabitants are two diſtinct races of people, and ſpeak two different languages; one that of the Friendly iſlands, the other peculiar to Tanna and thoſe in the neighbourhood. 63 terity of the inhabitants in the uſe of their lances. The people are very expert in the uſe of their weapons; on which Mr Wales makes the following remarks: "I muſt confeſs I have often been led to think the feats which Homer repreſents his heroes as performing with their ſpears, a little too much of the marvellous to be admitted in an heroic poem, I mean when confined within the ſtrait ſtays of Ariſtotle; nay, even ſo great an advocate for him as Mr Pope acknowledges them to be ſurpriſing; but ſince I have ſeen what theſe people can do with their wooden ſpears, and them badly pointed, and not of an hard nature, I have not the leaſt exception to any one paſſage in that great poet on this account. But if I ſee fewer exceptions, I can find infinitely more beauties in him, as he has, I think, ſcarcely an action, circumſtance, or deſcription of any kind whatever relating to a ſpear, which I have not ſeen and recogniſed among theſe people; as their whirling motion and whiſtling noiſe as they fly; their quivering motion in the ground when they fall; their meditating their aim when they are going to throw; and their ſhaking them in their hand as they go along."

The archipelago, in which Captain Cook had now remained a conſiderable time, is ſituated between 14. 29. and 20. 4. S. Lat. and between 166. 41. and 170. 21. E. Long. extending 125 leagues in the direction of N. N. W. ½ W. and S. S. E. ½ E. The principal iſlands are the Peak of the Etoile, Terra del Eſpiritu Santo, Mallicollo, St Bartholomew, the iſle of Lepers, Aurora, Whitſuntide iſle, Ambrym, Paoom, Apee, Three Hills, Sandwich, Erromango, Tanna, Immer, and Anatom. They were firſt diſcovered in 1606 by Quiros, who ſuppoſed them to be part of a ſouthern continent; nor were they viſited from that time till the year 1768, when M. Bougainville beſtowed upon them the name of the *Great Cyclades*, as already mentioned. This gentleman, however, beſides landing in the iſle of Lepers, only diſcovered that the country was not connected, but conſiſted of iſlands. Captain Cook examined the whole in ſuch an accurate manner, aſcertaining the ſituation of many of the iſlands, and diſcovering ſuch numbers of new ones, that he thought he had an undoubted right to impoſe a new name upon them, and therefore called them the *New Hebrides*.

64 New Caledonia diſcovered.

From the New Hebrides Captain Cook ſet ſail for New Zealand, in order to proſecute his voyage in ſearch of a ſouthern continent, but in three days diſcovered a large iſland, which he named *New Caledonia*; and which, next to New Zealand, is the largeſt in the Pacific ocean. It lies between 19. 37. and 22. 30. S. Lat. and between 163. 37. and 167. 14. E. Long. lying N. W. ¼ W. and S. E. ½ E. extending about 87 leagues in that direction, though its breadth does not anywhere exceed 10 leagues. The natives are ſtrong, active, well made, and ſeem to be a middle race between thoſe of Tanna and the Friendly iſles; and the women were more chaſte than thoſe of the iſlands farther to the eaſtward. The iſland afforded a conſiderable variety of plants for the botaniſts, and ſome excellent timbers of the ſpecies of the pitch pine, for maſts and ſpars. The wood is cloſe-grained, white, and tough; and very fit for the purpoſe. One of the ſmall iſlands ſurrounding the large one was named the *Iſle of Pines*, from the quantity of theſe trees found upon it; and another, from the number and variety of plants it afforded, had the name of *Botany Iſland*. The coaſt, however, was ſo dangerous, that our navigator, having no more time to ſpare, was obliged to leave ſome part of it unexplored, though the extent was determined, as has been already related. Mr Forſter was of opinion, that the language of this people is totally different from that of any of the other South Sea iſlands.

65 Norfolk iſland.

Proceeding from New Caledonia, our navigator next fell in with an iſland about five leagues in circumference, and of a good height, ſituated in S. Lat. 29. 2. 30. and E. Long. 168. 16.; on which he beſtowed the name of *Norfolk Iſland*. It was entirely uninhabited. Various trees and plants common in New Zealand were obſerved here, particularly the flax plant, which is more luxuriant in this iſland than in any part of New Zealand. The chief produce of the iſland is a kind of ſpruce-pine, many of the trees of which are 10 or 12 feet in circumference. The palm-cabbage likewiſe abounds here; and the coaſts are well ſtocked with excellent fiſh. On the 18th of October they arrived at Queen Charlotte's Sound in New Zealand; the ſituation of which was now aſcertained by Mr Wales with the utmoſt accuracy, its latitude being found 41. 5. 56½. S. and its longitude 174. 25. 7½ E. On examining the gardens which had been made, it was found that they were in a thriving condition, though they had been entirely neglected by the natives. Some of the cocks and hens were ſuppoſed to be ſtill in exiſtence, as a new laid hen's egg was found, though none were ſeen. 66 Arrival at New Zealand;

On the 10th of November Captain Cook ſet ſail from New Zealand in ſearch of a ſouthern continent; but having traverſed a vaſt extent of ſea for 17 days, from S. Lat. 43. 0. to 55. 48. he gave up all thoughts of finding any more land in this part of the ocean, and therefore determined to ſteer directly for the weſt entrance of the ſtraits of Magellan, with a deſign of coaſting the ſouthern part of Terra del Fuego quite round Cape Horn to Le Maire's Straits. As the world had hitherto received but very imperfect accounts of this coaſt, he thought a ſurvey of it would be of more advantage to navigation and geography than any thing he could expect to meet with in a higher latitude. On the 17th of December he reached the coaſt of Terra del Fuego, and in three days more anchored in a place to which he gave the name of *Chriſtmas Sound*. 67 at Terra del Fuego. The land appeared deſolate beyond any thing he had hitherto experienced. It ſeems to be entirely compoſed of rocky mountains, without the leaſt appearance of vegetation. Theſe mountains terminate in horrid precipices, the craggy ſummits of which ſpire up to a vaſt height; ſo that ſcarcely any thing in nature can have a more barren and ſavage proſpect than the whole of the country. In the courſe of his voyage along this coaſt, he could not but obſerve, that at no time had he ever made one of ſuch length where ſo little occurred of an intereſting nature. Barren and dreary, however, as the coaſt was, it was not totally deſtitute of accommodations about Chriſtmas Sound. Freſh water and wood for fuel were found about every harbour; and the country everywhere abounds with fowl, particularly geeſe.— A conſiderable number of plants were alſo found upon it, almoſt every ſpecies of which was new to the botaniſts. In paſſing by Cape Horn, it was wiſhed to determine whether it belonged to the land of Terra del Fuego, or to a ſmall iſland ſouth from it; but this was found impracticable on account of the foggy weather and dangerous ſea. Its latitude was 68 Remarks on a voyage round Cape Horn.

now determined to be 55. 58. S. and its longitude 67. 46. W. The coaſt appeared leſs dreary here than on the weſtern ſide of Terra del Fuego; for though the ſummits of ſome of the hills were rocky, the ſides and valleys ſeemed covered with a green turf and wooded in tufts. In paſſing this cape a remark was made by the captain, that if he were on a voyage round Cape Horn, to the weſt, and not in want of wood or water, or any other thing which might make it neceſſary to put into port, he would ſail a conſiderable way to the ſouthward, ſo as to be out of the reach of land altogether. By this method he would avoid the currents, whoſe force, he was of opinion, would be broken at 10 or 12 leagues diſtance from the ſhore, and farther off would be entirely deſtroyed. The extent of Terra del Fuego, and conſequently of Magellan's Straits, was found to be leſs than what is commonly laid down in maps and charts, and the coaſts, in general, leſs dangerous than has been uſually repreſented; though this muſt undoubtedly have been owing in a great meaſure to the weather, which happened to be remarkably temperate. In one of the ſmall iſlands near Staten Land, and which from their being diſcovered on new year's day, were called *New Year's Iſles*, a remarkable harmony was obſerved among the animals of different ſpecies with which theſe deſolate regions abound. The ſea-lions occupy the greateſt part of the ſea-coaſt; the bears occupy the inland; the ſhags are poſted in the higheſt cliffs; the penguins in ſuch places as have the beſt acceſs to and from the ſea; and the other birds chooſe more retired places. Occaſionally, however, all theſe animals were ſeen to mix together like domeſtic cattle and poultry in a farm yard, without one attempting to hurt the other in the leaſt. Even the eagles and vultures were frequently obſerved ſitting together on the hills among the ſhags, while none of the latter, either old or young, appeared to be diſturbed at their preſence. It is probable, therefore, that theſe birds of prey ſubſiſt by feeding on the carcaſes of the animals which die naturally or by various accidents, and which muſt be very numerous, from the immenſe quantity exiſting on the iſland.

69
Surpriſing concord of the animals in theſe parts.

70
Farther diſcoveries in the ſouthern regions.

Our navigator now ſet out in queſt of that extenſive coaſt laid down in Mr Dalrymple's chart, and in which is marked the gulf of St Sebaſtian; but when he came into the place where it is ſuppoſed to lie, neither land nor any certain ſigns of it could be met with. Some iſlands, however, were diſcovered, particularly Willis's iſland, in S. Lat. 54. 0. W. Long. 38. 23.; another named *Bird Iſland* and *South Georgia*, ſituated between 53. 57. and 54. 57. S. Lat. and between 38. 13. and 35. 34. W. Long. All theſe were covered with ſnow and ice to a great height. Not a tree was to be ſeen, not even a ſhrub, nor were there any rivulets or ſtreams of water: the only vegetables to be met with were a coarſe ſtrong-bladed graſs, wild burnet, and a kind of moſs. A conſiderable quantity of ſeals and penguins were met with, whoſe fleſh, though very coarſe, was preferred by the ſhip's company, even by Captain Cook himſelf, to the ſalt proviſions, which were now greatly decayed. The moſt ſoutherly land diſcovered by our navigator was that on which he beſtowed the name of *Southern Thule*, and which is ſituated in S. Lat. 59. 13. 30. W. Long. 27. 45. This was ſtill more deſolate than South Georgia, being forſaken even by the ſeals and penguins which abounded on it. Not a ſingle herb of any kind was ſeen upon it, but vaſt high and barren mountains, the tops of ſome of which reached above the clouds; and it may be remarked, that this ſeems to be the only part of the world, hitherto diſcovered, entirely unfit for the ſupport of animal life.

71
Of the exiſtence of a ſouthern continent.

Southern Thule was diſcovered on the 31ſt of January 1775; and from this to the 6th of February ſeveral other iſlands were diſcovered, and named *Cape Briſtol*, *Cape Montague*, *Saunders's Iſles*, *Candlemas Iſle*, and *Sandwich's Land*. With regard to this laſt, Captain Cook was undetermined whether it was a group of iſlands or part of a continent lying near the pole, as after all his diſappointments, he was ſtill inclined to think that ſuch a continent has an exiſtence, on account of the vaſt quantity of ice met with in the ſouthern ſeas, and which from its great height appears to be formed in bays and gulfs of the land, and not in the ocean itſelf. The greateſt part of the ſouthern continent, however, if it has any exiſtence, muſt be within the polar circle, where the ſea is ſo encumbered with ice, that the land muſt be inacceſſible. So great is the danger in navigating theſe ſouthern ſeas, that Captain Cook aſſerts, on the moſt probable grounds in the world, that ſuch lands as lie to the ſouthward of his diſcoveries could not be explored; and that even no man would venture further than he had done. Thick fogs, ſnow ſtorms, intenſe cold, and every thing that can render navigation difficult or dangerous, muſt be encountered; all which difficulties are greatly heightened by the inexpreſſibly horrid aſpect of the country itſelf. It is a part of the world doomed by nature never once to feel the warmth of the ſun's rays, but to be buried in everlaſting ſnow and ice. Whatever ports there may be on the coaſt, they are almoſt entirely covered with frozen ſnow of a vaſt thickneſs. If, however, any of them ſhould be ſo far open as to invite a ſhip into it, ſhe would run the riſk of being fixed there for ever, or of coming out in an ice iſland. To this it may be added that the iſlands and floats on the coaſt, the great falls from the ice clefts in the port, or a ſudden ſnow ſtorm, might be attended with equally fatal effects. For theſe reaſons our commander determined to abandon the purſuit of a land whoſe exiſtence was ſo unequivocal, but whoſe inutility, if it ſhould be diſcovered, was certain. One thing only remained to complete what he wiſhed to accompliſh, and that was to determine the exiſtence of Bouvet's land. In this inquiry he ſpent 16 days; but having run for 13 of theſe directly in the latitude aſſigned to that land, and found no appearance of it, or of Cape Circumciſion, he concluded that neither of them had any exiſtence, but that the navigators had been deceived by the appearance of ice iſlands. Two days more were ſpent in queſt of ſome land which had been obſerved more to the ſouthward, but with the like bad ſucceſs; after which our commander abandoned all farther thoughts of ſouthern diſcoveries, and prepared for returning to England. On his way home, however, he determined to direct his courſe in ſuch a manner as to fall in with the iſlands of Denia and Marſeveen. Theſe are laid down in Dr Halley's variation chart in latitude 41. 30. S. and about 4. 0. E. from the meridion of

72
Voyage in queſt of Bouvet's land.

73
Of the iſles of Denia and Marſeveen.

of the Cape of Good Hope. None of theſe iſlands could be found; and therefore our commander having very little time to ſpare either in ſearching for them or attempting to diſprove their exiſtence, made the beſt of his way to the Cape of Good Hope, and from thence to England. In his paſſage thither, he viſited the iſles of St Helena, Aſcenſion, and Fernando de Noronha. 74 Of the uſefulneſs of diſtilling ſea-water. An experiment was made on the uſe of the ſtill for procuring freſh water at ſea; the reſult of which was, that though the invention was uſeful upon the whole, yet it would not by any means be adviſable to truſt entirely to it. Provided indeed that there was not a ſcarcity of fuel, and that the coppers were good, as much might thus be procured as would ſupport life; but that no efforts would be ſufficient to procure the quantity neceſſary for the preſervation of health, eſpecially in hot climates. He was likewiſe convinced that nothing contributes more to the health of ſeamen than having plenty of freſh water. His laſt ſtage in this ſecond voyage before his arrival in England was at Fayal, one of the Azores iſlands; and his only deſign in ſtopping here was to give Mr Wales an opportunity of finding the rate of the watches going, that ſo he might be enabled to find the longitude of theſe iſlands with the greater certainty.

75 Third voyage. 76 Viſits the iſle of Teneriffe.

In our commander's third voyage he touched at the iſland of Teneriffe inſtead of Madeira, looking upon the former to be a better place for procuring refreſhments; and was convinced of the juſtneſs of his conjecture by the facility with which proviſions of all kinds were obtained. The air of the country is exceedingly healthy, and proper for thoſe ſubject to pulmonary complaints. This was accounted for by a gentleman of the place from the great height of the iſland, by which it was in the power of any perſon to change the temperature of the air as he pleaſed; and he expreſſed his ſurpriſe that phyſicians, inſtead of ſending their patients to Nice or Liſbon, did not ſend them to Teneriffe. 77 Tea-ſhrub. From the ſame gentleman it was learned, that the tea ſhrub grows in that iſland as a common weed, which is conſtantly exterminated in large quantities. The Spaniards, however, ſometimes uſe it as tea, and aſcribe to it all the qualities of that brought from the Eaſt Indies. They give it alſo the name of tea, and ſay that it was found in the country when the iſlands were firſt diſcovered. 78 Impregnated lemon. Another botanical curioſity is the fruit called the *impregnated lemon*, which is a perfect and diſtinct lemon incloſed within another, and differing from the outer only in being a little more globular.

79 Prince Edward's iſlands diſcovered.

From Teneriffe Captain Cook proceeded to the Cape of Good Hope, and from thence to the ſouthward, where he fell in with two iſlands, the larger of which is about 15 leagues in circuit, and the ſmaller about nine; their diſtance from one another being about five leagues. The one of theſe iſlands lies in S. Lat. 46. 53. and E. Long. 37. 46.; the other in S. Lat. 46. 4. E. Long. 38. 8. As the ſhips paſſed through between them, they could not diſcern either tree or ſhrub upon any of them, even with the aſſiſtance of their beſt glaſſes. The ſhore ſeemed to be bold and rocky, their internal parts full of mountains, whoſe ſides and ſummits were covered with ſnow. Theſe two, with four others, which lie from 9 to 12 degrees of longitude more to the eaſt, and nearly in the ſame latitude, had been diſcovered in the year 1772 by Captain Marion du Freſne and Crozet, two French navigators, in their paſſage from the Cape of Good Hope to the Philippines. As no names had been aſſigned to them in a chart of the Southern ocean communicated to Captain Cook in 1775, the two larger ones were by him diſtinguiſhed by the name of *Prince Edward's iſlands*, in honour of his majeſty's fourth ſon; the other four, with a view to commemorate the diſcoverers, were called *Marion's* and *Crozet's iſlands*.

80 Voyage in queſt of Kerguelen's land.

From theſe our commander ſteered to the ſouthward in ſearch of Kerguelen's land, which he had been inſtructed to touch at, in order to diſcover, if poſſible, a good harbour there. In his paſſage to it ſeveral new iſlands were diſcovered; one, to which Kerguelen had given the name of the *Iſland of Rendezvous*, Captain Cook, on account of its ſhape, changed to that of *Blight's Cap*. It is ſituated in S. Lat. 48. 29. E. Long. 68. 40. and is a high round rock, inacceſſible to all creatures but birds. 81 Deſcription of that iſland. Next day he fell in with Kerguelen's land, at firſt thought to be a part of the ſouthern continent, but afterwards found by Kerguelen himſelf to be an iſland. The extent of it, however, was not determined either by the French navigator or by Captain Cook. The former reckons it at 200 leagues in circumference, but Captain Cook eſtimates it at much leſs. Our navigator could not get any extenſive view of it on account of the foggy weather; but as far as could be diſcovered, it was barren and deſolate, inſomuch that there was neither food nor covering for cattle of any kind, ſo that they would inevitably periſh if any were left. Even the ſea-coaſts were in a great meaſure deſtitute of fiſh; but the ſhore was covered with innumerable multitudes of ſeals, together with penguins and other birds; all of which were ſo void of fear that any quantity whatever might be killed without any difficulty. Not a ſingle tree nor ſhrub could be ſeen, nor a piece of drift wood on the ſhore; and herbage of every kind was likewiſe very ſcarce. A prodigious quantity of the ſea-weed called by Sir Joſeph Banks *fucus giganteus*, was found in one of the bays. The whole variety of plants found in this iſland did not exceed ſixteen or eighteen ſpecies. The harbour in which our navigator made his longeſt ſtay on this deſolate coaſt was named *Port Palliſer*, and is ſituated in S. Lat. 49. 3. E. Long. 69. 37. In this voyage our navigator undoubtedly diſplayed ſuperior nautical abilities to thoſe of M. Kerguelen, who in two voyages to the place had never been able to bring his ſhips to anchor on any part of the coaſt.

82 Of Van Diemen's land.

From Kerguelen's land our navigator proceeded to the coaſt of New Holland, where he now touched at the ſouthern part called *Van Diemen's Land*, where he anchored in Adventure bay. Here they found plenty of wood and water, with abundance of graſs, coarſe indeed, where they went firſt aſhore, but afterwards much finer and proper for the cattle. Here, as everywhere elſe, the latitudes and longitudes were ſettled with the greateſt exactneſs. The bottom of Adventure bay was found to lie in S. Lat. 43. 21. 6.; E. Long. 147. 29. The inhabitants viſited them in a friendly manner, but ſeemed as ſtupid and inſenſible as thoſe they had formerly ſeen. They ſeemed to be totally ignorant of the uſe of iron, and ſet no value upon any thing in the ornamental way excepting beads; nor did they ſeem to be acquainted even with the uſe of fiſh-hooks. Here they found the ſtories of the ancient fauns and ſatyrs living in hollow trees realized. Some huts covered with bark, and of a moſt wretched conſtruction, were indeed found near the ſhore; but the moſt commodious habitations were afforded by the largeſt trees. Theſe had their trunks hollowed out by fire to the height of ſix or ſeven feet; and there was room enough in one of them for three or four perſons to ſit round a hearth made of clay; and it may juſtly ſeem ſurpriſing, that notwithſtanding the extreme violence offered to the vegetative powers of the tree by forming this habitation, it ſtill continued to flouriſh in conſequence of one ſide being left entire. The people, notwithſtanding their extreme barbarity, were ſuppoſed to proceed from the ſame ſtock with thoſe of the South ſea iſlands. As in one of their viſits the natives had ſeized upon two pigs which had been brought aſhore, apparently with an intention to kill them, the commander determined to make them a preſent of theſe animals; though from their exceſſive ſtupidity and inattention there was no probability of their allowing them to propagate, if they had been put directly into their hands. To prevent this, Captain Cook ordered the two they had attempted to ſeize, being a boar and a ſow, to be carried about a mile within the head of the bay, and ſaw them left by the ſide of a freſh water rivulet. He was prevented from leaving any other ſpecies by a conſideration of the barbarity of the inhabitants.

83
Viſit to New Zealand.

From New Holland our navigator proceeded to New Zealand, where he arrived on the 12th of February 1777, and anchored in Queen Charlotte's ſound. Here he was deſirous of leaving a further ſupply of animals; but the inhabitants had hitherto ſhown ſuch careleſſneſs about thoſe which had been left, that he durſt not venture to leave any other than two goats, a male and female with kid, and two hogs, a boar and ſow. He was informed, however, that one chief had ſeveral cocks and hens in his poſſeſſion, ſo that there was ſome probability of theſe animals being allowed to multiply; and as ten or a dozen hogs had at different times been left by Captain Cook, beſides thoſe put on ſhore by Captain Furneaux, it ſeems alſo to be likely that this race of creatures will increaſe either in a wild or domeſtic ſtate, or both. The gardens had ſtill been almoſt totally neglected, and ſome of them deſtroyed. Thoſe which remained, however, produced cabbages, onions, leeks, purſlain, radiſhes, and a few potatoes. Theſe laſt had been brought from the Cape of Good Hope, and were ſo greatly meliorated by the change of ſoil, that with proper cultivation they ſeemed to bid fair for excelling thoſe of other countries.

84
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taheite.

Our navigator's next courſe was towards the iſland of Otaheite; in the run to which he diſcovered the iſland of Mangea, ſituated in S. Lat. 22. 57. E. Long. 201. 53. From thence he proceeded to Wateoa, where Omai, on his way home, recogniſed three of his countrymen, natives of the Society iſlands, who had arrived here by the following accident. About 12 years before, 20 of the natives of Otaheite had embarked in a canoe, in order to viſit the neighbouring iſland of Ulietea. A violent ſtorm aroſe, which drove them out of their courſe, and they ſuffered incredible hardſhips by famine and fatigue, ſo that the greateſt part of them periſhed. Four men continued hanging by the ſide of the veſſel for four days after it was overſet, when they were at laſt brought within ſight of the people of this iſland. The latter immediately ſent out their canoes, and brought them aſhore, treating them afterwards with ſo much kindneſs, that the three who now ſurvived expreſſed no deſire of returning to their own country, though they had now an opportunity, but choſe rather to remain where they were. This iſland is ſituated in S. Lat. 20. 1. E. Long. 201. 45. and is about 6 leagues in circumference. The inhabitants are ſaid to be equally amiable in their perſons and diſpoſitions.

Viſiting a ſmall iſland named *Wenooa-ete*, or *Otakootaia*, ſituated in S. Lat. 19. 15. and E. Long. 201. 37. our commander found it without inhabitants, though there were undoubted marks of its being occaſionally frequented. Harvey's iſland, which in his former voyage had been deſtitute of inhabitants, was now found to be well peopled; but the inhabitants ſhowed ſuch an hoſtile diſpoſition that no refreſhments could be procured; for which reaſon it was determined to ſteer for the Friendly iſlands, where there was a certainty of meeting with an abundant ſupply. In his way thither he touched at Palmerſtone iſland, from a ſmall iſle near which a ſupply of 1200 cocoa nuts was obtained, beſides abundance of fiſh and birds of various kinds. Had this iſland been capable of furniſhing water, the captain would have preferred it to any of the inhabited ones for the purpoſe of procuring refreſhments, as they could be had in any quantity without moleſtation from the petulance of the inhabitants. As water at this time happened to be a ſcarce article, our navigator was obliged to ſupply himſelf from the ſhowers which fell, and which afforded as much in an hour as he could procure by diſtillation in a month.

85
Palmerſtone iſland a proper place of refreſhment, but without water.

During the time of reſidence at the Friendly iſlands, our navigator viſited one named *Hapaee*, at which no European ſhip had ever touched before. Here he was entertained in a friendly manner, ſupplied with refreſhments, and left ſome uſeful animals. Great additions were made to the geography of theſe iſlands, and many curious remarks made on the inhabitants and natural products. It was obſerved by Mr Anderſon, that the people had very proper notions of the immateriality and immortality of the human ſoul; and he thought himſelf authorized to aſſert that they did not worſhip any part of the viſible creation.

86
Receptio
of Omai at Otaheite.

Paſſing by a ſmall iſland named *Toobouai*, about five or ſix miles in extent, and ſituated in S. Lat. 23. 25. E. Long. 210. 37. our navigators now arrived at Otaheite. Here Omai met with his relations, ſome of whom received him with apparent indifference; but his meeting with an aunt and a ſiſter was marked with expreſſions of the moſt tender regard. It was Huaheine, however, that was deſtined for the place of Omai's final reſidence, and thither the captain repaired on purpoſe to ſettle him. The affair was conducted with great ſolemnity; and Omai brought with him a ſuitable aſſortment of preſents to the chiefs, went through a great number of religious ceremonies, and made a ſpeech, the ſubject of which had been dictated to him by Captain Cook. The reſult of the negociation was, that a ſpot of ground was aſſigned

87
He is ſettled at Huaheine.

him, extending about two hundred yards along the ſhore of the harbour, with a proportionable part of an adjacent hill. The carpenters of both ſhips were then employed in conſtructing a houſe for him, in which he might ſecure his European commodities. At the ſame time a garden was made for his uſe, in which were planted ſhaddocks, vines, pine-apples, melons, and ſeveral other garden vegetables. Here he met with a brother, ſiſter, and ſiſter-in-law, by whom he was very affectionately received; but it was diſcovered with concern, that none of his relations were able to protect him in caſe of any attack on his perſon or property; ſo that there was too much reaſon to fear that he would be plundered immediately on the departure of the Engliſh. To prevent this, if poſſible, Captain Cook adviſed him to conciliate the favour and engage the patronage and protection of ſome of the moſt powerful chiefs by proper preſents; at the ſame time that he himſelf took every opportunity of letting the inhabitants know that it was his intention to return to the iſland again, and if he did not find Omai in the ſame ſtate of ſecurity in which he left him, thoſe by whom he had been injured would certainly feel the weight of his reſentment. About a fortnight after leaving Huaheine, the captain had a meſſage from Omai; in which he informed him that every thing went well, only that his goat had died in kidding, for which he deſired another might be ſent; and accompanied this requeſt with another for two axes, which were ſent along with a couple of kids, male and female.

88
Remarks on the Society iſlands.

On taking his final leave of the Society iſlands, Captain Cook obſerves, that it would have been far better for theſe poor people never to have known the ſuperiority of the Europeans in ſuch arts as render life comfortable, than after once being acquainted with it to be again abandoned to their original incapacity of improvement; as, if the intercourſe between them and us ſhould be wholly diſcontinued, they could not be reſtored to that happy ſtate of mediocrity in which they were found. It ſeemed to him that it was become in a manner incumbent on the Europeans to viſit theſe iſlands once in three or four years, in order to ſupply them with thoſe conveniences of which they have taught them the uſe. It is indeed to be apprehended, that by the time the iron tools which were then among them are worn out, they will have forgotten the uſe of their own; as in this laſt voyage it was obſerved that the uſe of their former tools was almoſt totally aboliſhed.

89
Chriſtmas iſland diſcovered.

Having left the Society iſlands, Captain Cook now proceeded to the northward, croſſing the equator on the 22d and 23d of December; and on the 24th diſcovered a low uninhabited iſland about 15 or 20 leagues in circumference. Here the longitude and latitude were exactly determined by means of an eclipſe of the ſun. The weſt ſide of it, where the eclipſe was obſerved, lies in N. Lat. 1. 59. E. Long. 202. 30. From the time of its diſcovery it obtained the name of *Chriſtmas Iſland.* Plenty of turtle was found upon it, and the captain cauſed the ſeeds of the cocoa-nut, yams, and melons, to be planted.

90
Sandwich iſles.

Proceeding ſtill to the northward, our navigator next fell in with five iſlands, to which he gave the general name of *Sandwich Iſles*, in honour of his patron. Their names in the language of the country are Woahoo, Atooi, Oneeheeow, Oreehoua, and Tehoora. They are ſituated between latitude 21. 30. and 22. 15. North, and between 199. 20. and 201. 30. E. Long. The longitude was deduced from no fewer than 72 ſets of lunar obſervations. The largeſt of theſe iſlands is Atooi, and does not in the leaſt reſemble the other iſlands of the South ſea formerly viſited by our navigator, excepting only that it has hills near the centre, which ſlope gradually towards the ſea-ſide. The only domeſtic animals found upon it were hogs, dogs, and fowls. Captain Cook deſigned to have made the inhabitants of this iſland a preſent of ſome others; but being driven out of it by ſtreſs of weather, he was obliged to land them upon a ſmaller one named *Oneeheeow*. They were a he-goat with two females, and a boar and ſow of the Engliſh breed, which is much ſuperior to that of the South Sea iſlands. He left alſo the ſeeds of melons, pumkins, and onions. The ſoil of this iſland ſeemed in general to be poor: it was obſervable that the ground was covered with ſhrubs and plants, ſome of which had a more delicious fragrancy than had been experienced before. The inhabitants of theſe iſlands are much commended, notwithſtanding their horrid cuſtom of eating human fleſh. In every thing manufactured by them there is an ingenuity and neatneſs in an uncommon degree; and the elegant form and poliſh of ſome of their fiſhing-hooks could not be exceeded by an European artiſt, even aſſiſted by all his proper tools. From what was ſeen of their agriculture alſo, it appeared that they were by no means novices in that art, and that the quantity and goodneſs of their vegetable productions might with propriety be attributed as much to their ſkilful culture as to the fertility of the ſoil. The language of the Sandwich iſles is almoſt identically the ſame with that of Otaheite.

91
American coaſt diſcovered.

Proceeding farther to the northward, our navigators diſcovered the coaſt of New Albion on the 7th of March 1778. Its appearance was very different from that of the countries with which they had been hitherto converſant. The land was full of mountains, the tops of which were covered with ſnow; while the valleys between them, and the grounds on the ſea-coaſt, high as well as low, were covered with trees, which formed a beautiful proſpect as of one vaſt foreſt. The place where they landed was ſituated in N. Lat. 44. 33. E. Long. 235. 20. At firſt the natives ſeemed to prefer iron to every other article of commerce; but at laſt they ſhowed ſuch a predilection for braſs, that ſcarcely a bit of it was left in the ſhips except what belonged to the neceſſary inſtruments. It was obſerved alſo, that theſe people were much more tenacious of their property than any of the ſavage nations that had hitherto been met with, inſomuch that they would part neither with wood, water, graſs, nor the moſt trifling article, without a compenſation, and were ſometimes very unreaſonable in their demands; with which, however, the captain always complied as far as was in his power.

92
Nootka found.

The place where the Reſolution was now anchored was by our navigator called *St George's Sound*, but he afterwards underſtood that the natives gave it the name of *Nootka*. Its entrance is ſituated in the eaſt corner of Hope Bay, in N. Lat. 49. 33. E. Long. 233. 12.

93
Mildneſs of the climate.

The climate, as far as they had an opportunity of obſerving it, was much milder than that on the eaſtern coaſt

Cook's iſcoveries.

94 atives ac- uainted ith the ſe of etals.

coaſt of the American continent in the ſame parallel of latitude; and it was remarkable that the thermometer, even in the night, never fell lower than 42°, while in the day-time it frequently roſe to 60°. The trees met with here are chiefly the Canadian pine, white cypreſs, and ſome other kinds of pine. There ſeemed to be a ſcarcity of birds, which are much haraſſed by the natives, who ornament their clothes with the feathers, and uſe the fleſh for food. The people are no ſtrangers to the uſe of metals, having iron tools in general uſe among them; and Mr Gore procured two ſilver ſpoons of a conſtruction ſimilar to what may be obſerved in ſome Flemiſh pictures, from a native who wore them round his neck as an ornament. It is moſt probable that theſe metals have been conveyed to them by the way of Hudſon's bay and Canada: nor is it improbable that ſome of them have been introduced from the north-weſtern parts of Mexico.

95 rince William's und.

While Captain Cook ſailed along this coaſt, he kept always at a diſtance from land when the wind blew ſtrongly upon it; whence ſeveral large gaps were left unexplored, particularly between the latitudes of 50° and 55°. The exact ſituation of the ſuppoſed ſtraits of Anian was not aſcertained, though there is not the leaſt doubt, that if he had lived to return by the ſame way in 1779, he would have examined every part with his uſual accuracy. On departing from Nootka ſound, our navigator firſt fell in with an iſland in N. Lat. 59. 49. E. Long. 216. 58. to which he gave the name of *Kay's Iſland*. Several others were diſcovered in the neighbourhood; and the ſhip came to an anchor in an inlet named by the captain *Prince William's ſound*. Here he had an opportunity of making ſeveral obſervations on the inhabitants, as well as on the nature of the country. From every thing relative to the former, it was concluded, that the inhabitants were of the ſame race with the Eſquimaux or Greenlanders. The animals were much the ſame with thoſe met with at Nootka, and a beautiful ſkin of one animal, which ſeemed to be peculiar to the place, was offered to ſale. Mr Anderſon was inclined to think that it was the ſame to which Mr Pennant has given the name of the *caſan marmot*. The alcedo, or great king's-fiſher, was found here, having very fine and bright colours. The humming bird alſo came frequently, and flew about the ſhip when at anchor; though it is ſcarce to be ſuppoſed that it can live throughout the winter on account of the extreme cold. The water-fowl were in conſiderable plenty; and there is a ſpecies of diver which ſeemed to be peculiar to the place. Almoſt the only kinds of fiſh met with in the place were torſk and holibut. The trees were chiefly the Canadian and ſpruce pine, ſome of which were of a conſiderable height and thickneſs. The ſound is judged by Captain Cook to occupy a degree and a half of latitude and two of longitude, excluſively of its arms and branches, which were not explored. There was every reaſon to believe that the inhabitants had never been viſited by any European veſſel before; but our navigator found them in poſſeſſion not only of iron but of beads, which it is probable are conveyed to them acroſs the continent from Hudſon's bay.

96 ok's er.

Soon after leaving Prince William's ſound, our navigators fell in with another inlet, which it was expected would lead either to the northern ſea or to Hudſon's or Baffin's bay; but upon examination it was found to end in a large river. This was traced for 210 miles from the mouth, as high as N. Latitude 61. 30. and promiſes to vie with the moſt conſiderable ones already known, as it lies open by means of its various branches to a very conſiderable inland communication. As no name was given by our commander to this river, it was ordered by Lord Sandwich to be named *Cook's river*. The inhabitants ſeemed to be of the ſame race with thoſe of Prince William's ſound; and like them had glaſs beads and knives; they were alſo clothed in very fine furs; ſo that it ſeemed probable that a valuable fur-trade might be carried on from that country. Several attempts have accordingly been made from the Britiſh ſettlements in the Eaſt Indies to eſtabliſh a traffic of that kind; but little benefit accrued from it except to the proprietors of the firſt veſſel, her cargo having greatly lowered the price of that commodity in the Chineſe market. It muſt be obſerved, that on the weſtern ſide of the American continent, the only valuable ſkins met with are thoſe of the ſea-otter; thoſe of the other animals, eſpecially foxes and martens, being of an inferior quality to ſuch as are met with in other parts.

Cook's Diſcoveries.

97 They fall in with the iſlands diſcovered by the Ruſſians.

Proceeding farther to the northward, our navigators now fell in with a race of people who had evidently been viſited by the Ruſſians, and ſeemed to have adopted from them ſome improvements in dreſs, &c. In the proſecution of this part of their voyage, it appeared that they had been providentially conveyed in the dark through a paſſage ſo dangerous, that our commander would not have ventured upon it in the day-time. They were now got in among thoſe iſlands which had lately been diſcovered by Captain Beering and other Ruſſian navigators, and came to an anchor in a harbour of Oonalaſhka, ſituated in N. Lat. 53. 55. E. Long. 193. 30. Here it was remarked that the inhabitants had as yet profited very little by their intercourſe with the Ruſſians; ſo that they did not even dreſs the fiſh they uſed for their food, but devoured them quite raw.

98 A volcano

From Oonalaſhka our navigator proceeded again towards the continent, which he continued to trace as far as poſſible to the northward. In N. Lat. 54. 48. E. Long. 195. 45. is a volcano of the ſhape of a perfect cone, having the crater at the very ſummit. On the coaſt farther to the north the ſoil appears very barren, producing neither tree nor ſhrub, though the lower grounds are not deſtitute of graſs and ſome other plants. To a rocky point of conſiderable height, ſituated in N. Lat. 58. 42. E. Long. 197. 36. our commander gave the name of *Cape Newnham*.

99 Cape Prince of Wales.

100 Vicinity of the continents of Aſia and America

Here Mr Anderſon, the ſurgeon of the Reſolution, died of a conſumption, under which he had laboured for more than twelve months. Soon after he had breathed his laſt, land being ſeen at a diſtance, it was named *Anderſon's iſland;* and on the 9th of Auguſt the ſhip anchored under a point of the continent, which he named *Cape Prince of Wales*. This is remarkable for being the moſt weſterly point of the American continent hitherto known. It is ſituated in N. Lat. 65. 46. E. Long. 191. 45. It is only 39 miles diſtant from the eaſtern coaſt of Siberia; ſo that our commander had the pleaſure of aſcertaining the vicinity of the two continents to each other, which had only been imperfectly done by the Ruſſian navigators. Setting ſail from this point next day, he ſteered to the weſt and north, when he ſoon fell in with the country of the Tſchutſki, which had been explored by Beering in 1728. Here he had an opportunity of correcting M. Stœhlin's map, who had placed in theſe ſeas an imaginary iſland, on which he beſtowed the name of *Alaſchka*. Being convinced that the land he had now reached was part of the Aſiatic continent, our commander directed his courſe eaſtward, in order to fall in with that of America; and on the 17th reached the latitude of 70. 33. and E. Long. 197. 41. Here they began to perceive that brightneſs in the horizon called by mariners the *blink of the ice;* and in 70. 41. they had got quite up to it, ſo that no farther progreſs could be made. 101 Their progreſs northward ſtopped by ice. Next day they made a ſhift to get as far as 70. 44; but the ice was now as compact as a wall, and about ten or twelve feet in height. Its ſurface was extremely rugged, and farther to the northward appeared much higher. Its ſurface was covered with pools of water; and great numbers of ſea-lions lay upon it, whoſe fleſh they were now glad to uſe as food. Our commander continued to traverſe the Icy ſea till the 29th; but the obſtructions becoming every day greater and greater, it was thought proper to give over all further attempts of finding a paſſage to Europe for that year. He did not, however, omit the inveſtigation of the Aſiatic and American coaſts until he had fully aſcertained the accuracy of Captain Beering's accounts as far as he went, and corrected the errors of M. Stœhlin. Great additions were thus made to the geographical knowledge of this part of the globe; and Mr Coxe obſerves, that "it reflects no ſmall honour upon the Britiſh name, that our great navigator extended his diſcoveries much farther in one expedition, and at ſo great a diſtance from the point of his departure, than the Ruſſians accompliſhed in a long ſeries of years, and in parts belonging or contiguous to their own empire."

102 Arrival at Oonalaſhka.

An end of this celebrated navigator's diſcoveries, however, was now at hand. From Beering's ſtraits he ſailed for Oonalaſhka, where he arrived on the 2d of October, and ſtaid for ſome time in order to repair his ſhips. While the carpenters were employed in this work, one-third of the people had permiſſion to go on ſhore by turns, in order to gather berries, with which the iſland abounds, and which, though now beginning to decay, were of great ſervice, in conjunction with the ſpruce-beer, to preſerve the people fom the ſcurvy. Such a quantity of fiſh was likewiſe procured, as not only ſerved to ſupply the ſhips for the preſent, but likewiſe allowed a great number to be carried out to ſea; ſo that hence a conſiderable ſaving was made of the proviſions of the ſhips, which was an article of very conſiderable conſequence. On the 8th of the month our commander received a very ſingular preſent from ſome perſons unknown, by the hands of an Oonalaſhka man named *Derramouſhk*. It conſiſted of a rye-loaf, or rather a ſalmon-pye in the form of a loaf, and highly ſeaſoned with pepper. This man had the like preſent for Captain Clerke, and each of them was accompanied with a note which none on board could underſtand: a few bottles of rum, with ſome wine and porter, were ſent in exchange: it being ſuppoſed that ſuch a preſent would be more acceptable than any other thing that could be ſpared. Corporal Lediard of the marines, an intelligent man, was at the ſame time directed to accompany Derramouſhk, for the purpoſe of gaining a more ſatisfactory account of the country. On the tenth of the month he returned with three Ruſſian ſeamen or furriers, who with ſeveral others reſided at Egoochſhac, where they had a dwelling-houſe, ſome ſtore-houſes, and a ſloop about 30 tons burden. One of theſe people was either maſter or mate of the veſſel, and all of them were very ſober and decent in their behaviour. The greateſt difficulty aroſe from the want of an interpreter; for which reaſon the converſation was carried on by ſigns. However, the captain obtained a ſight of two ſea-charts, both of which he was allowed to copy. One of them included the ſea of Penſhinſk, part of the coaſt of Tartary down to the latitude 41°; the Kurile iſlands, and the peninſula of Kamtſchatka. The other comprehended all the diſcoveries that had been made from the time of Captain Beering to the year 1777; but theſe were found to be very trifling. Indeed our navigator was aſſured by all the Ruſſians whom he had occaſion to ſee, that they knew of no other iſlands than thoſe laid down in the charts juſt mentioned, and that none of them had ever ſeen any part of the American continent excepting what lies oppoſite to the country of the Tſchutſki. 103 Character of the inhabitants. With regard to the natives of Oonalaſhka, they are to appearance the moſt inoffenſive and peaceable people in the world, not to be in a ſtate of civilization; though perhaps this may be owing in ſome meaſure to the connexion they have long had with the Ruſſians. From the affinity obſerved between the language of the Eſquimaux Greenlanders, and thoſe of Norton's ſound in N. Lat. 64. 55. there is great reaſon to believe that all thoſe nations are of the ſame extraction; and if that be the caſe, there is little reaſon to doubt that a communication by ſea exiſts between the eaſtern and weſtern ſides of the American continent; which, however, may very probably be ſhut up by ice in the winter time, or even for the moſt part throughout the year. 104 A communication probable betwixt the eaſt and weſt coaſts of America.

105 Conſequences of Captain Cook's diſcoveries.

The return of Captain Cook to the Sandwich iſlands, with the lamentable cataſtrophe that enſued, have been already related under the former article. We ſhall now briefly enumerate the conſequences of his diſcoveries with reſpect to the advancement of ſcience. Theſe are principally his having overthrown the hypotheſis of a ſouthern continent of immenſe extent, uſually ſpoken of under the name of *Terra auſtralis incognita;* his demonſtration of the impracticability of a northern paſſage either by Aſia or America to the Eaſt Indies; and his having eſtabliſhed a ſure method of preſerving the health of ſeamen through the longeſt ſea-voyages. It is remarked by the biſhop of Carliſle, that one great advantage reſulting from the late ſurveys of the globe, is the refutation of fanciful theories, too likely to give birth to impracticable undertakings. The ingenious reveries of ſpeculative philoſophers will now be obliged to ſubmit, perhaps with reluctance, to the ſober dictates of truth and experience; nor is it only by diſcouraging future unprofitable ſearches that the late voyages are likely to be of ſervice to mankind, but likewiſe by leſſening the dangers and diſtreſſes formerly experienced in thoſe ſeas which are within the actual line of commerce and navigation.

The intereſts of ſcience, as well as of commerce, are highly indebted to the labours of our illuſtrious navigator. Before his time almoſt half the ſurface of the globe was involved in obſcurity and confuſion: but now ſuch improvements have been made, that geography has aſſumed a new face, and become in a manner a new ſcience; having attained ſuch completeneſs as to leave only ſome leſs important parts to be explored by future voyagers. Other ſciences beſides geography have been advanced at the ſame time. Nautical aſtronomy, which was in its infancy when the late voyages were undertaken, is now brought to much greater perfection; and, during Captain Cook's laſt expedition, many even of the petty officers could take the diſtance of the moon from the ſun or from a ſtar, the moſt delicate of all obſervations, with ſufficient accuracy; and the officers of ſuperior rank would have been aſhamed to have it thought that they did not know how to obſerve for, and compute, the time at ſea: a thing before hardly mentioned among ſeamen. It muſt, however, be remembered, that a great part of the merit in this reſpect is due to the board of longitude. In conſequence of the attention of that board to the important object juſt mentioned, liberal rewards have been given to mathematicians for perfecting the lunar tables and facilitating calculations; and artiſts have been amply encouraged in the conſtruction of watches, and other inſtruments better adapted to the purpoſes of navigation than any that formerly exiſted.

A vaſt addition of knowledge has been gained with reſpect to the ebbing and flowing of the tides; the direction and force of the currents at ſea: the nature of the polarity of the needle, and the cauſe of its variations. Natural knowledge has been increaſed by experiments on the effects of gravity in different and very diſtant places; and from Captain Cook's having penetrated ſo far into the ſouthern regions, it is now aſcertained, that the phenomenon uſually called the *aurora borealis*, is not peculiar to high northern latitudes, but belongs equally to all cold climates, whether north or ſouth.

No ſcience, however, perhaps ſtands more indebted to theſe voyages than that of botany. At leaſt 1200 new ſpecies of plants have been added to thoſe formerly known; and every other department of natural hiſtory has received large additions. Beſides all this, there have been a vaſt many opportunities of obſerving human nature in its different ſituations. The iſlands viſited in the middle of the Pacific ocean are inhabited by people who, as far as could be obſerved, have continued unmixed with any different tribe ſince their firſt ſettlement. Hence a variety of important facts may be collected with reſpect to the attainments and deficiencies of the human race in an uncultivated ſtate, and in certain periods of ſociety. Even the curioſities brought from the newly diſcovered iſlands, and which enrich the Britiſh muſeum and the late Sir Aſhton Lever's (now Mr Parkinſon's) repoſitory, may be conſidered as a valuable acquiſition to this country, and affording no ſmall fund of inſtruction and entertainment.

There are few inquiries more generally intereſting than thoſe which relate to the migrations of the various colonies by which the different parts of the earth have been peopled. It was known in general, that the Aſiatic nation called the *Malayans* poſſeſſed in former times much the greateſt trade of the Indies, and that their ſhips frequented not only all the coaſts of Aſia, but even thoſe of Africa likewiſe, and particularly the large iſland of Madagaſcar; but that from Madagaſcar to the Marqueſas and Eaſter iſland, that is, nearly from the eaſt ſide of Africa till we approach the weſt coaſt of America, a ſpace including almoſt half the circumference of the globe, the ſame nation of the oriental world ſhould have made their ſettlements, and founded colonies throughout almoſt every intermediate ſtage of this immenſe tract, in iſlands at amazing diſtances from the mother continent, is a hiſtorical fact that before Captain Cook's voyages could not be known, or at leaſt but very imperfectly. This is proved, not only by a ſimilarity of manners and cuſtoms, but likewiſe by the affinity of language; and the collections of words which have been made from all the widely-diffuſed iſlands and countries viſited by Captain Cook, cannot fail to throw much light on the origin of nations, and the manner in which the earth was at firſt peopled.

Beſides this, information has been derived concerning another family of the earth formerly very much unknown. This was the nation of the Eſquimaux or Greenlanders, who had formerly been known to exiſt only on the north-eaſtern part of the American continent. From Captain Cook's accounts, however, it appears, that theſe people now inhabit alſo the coaſts and iſlands on the weſt ſide of America oppoſite to Kamtſchatka. From theſe accounts it appears alſo, that the people we ſpeak of have extended their migrations to Norton ſound, Oonalaſhka, and Prince William's ſound; that is, nearly to the diſtance of 1500 leagues from their ſtations in Greenland and the coaſt of Labradore. Nor does this curious fact reſt merely on the evidence ariſing from the ſimilitude of manners; for it ſtands confirmed by a table of words, exhibiting ſuch an affinity of language as muſt remove every doubt from the mind of the moſt ſcrupulous inquirer.

From the full confirmation of the vicinity of the two great continents of Aſia and America, it can no longer be ſuppoſed ridiculous to believe, that the latter received its inhabitants from the former; and by the facts recently diſcovered, a degree of further evidence is added to thoſe which might formerly be derived from nature concerning the authenticity of the Moſaic accounts. It is not indeed to be doubted, that the inſpired writings will ſtand the teſt of the moſt rigorous inveſtigation; nor will it ever be found, that true philoſophy and divine revelation, can militate againſt each other. The rational friends of religion are ſo far from dreading the ſpirit of enquiry, that they wiſh for nothing more than a candid and impartial examination of the ſubject, according to all the lights which the improved reaſon and enlarged ſcience of man can afford.

Another good effect of the voyages of Captain Cook is, that they have excited in other nations a zeal for ſimilar undertakings. By order of the French government, Meſſ. de la Peyrouſe and de Langle ſailed from Breſt in Auguſt 1785, in the frigates Bouſſole and Aſtrolabe, on an enterpriſe, the purpoſe of which was to improve geography, aſtronomy, natural hiſtory, and philoſophy, and to collect an account of the cuſtoms and manners of different nations. For the more effectual proſecution of the deſign, ſeveral gentlemen were appointed to go out upon the voyage, who were known to excel in different kinds of literature. The officers of the Bouſſole were men of the beſt information and firmeſt reſolution; and the crew contained a number of artificers in various branches of mechanics. Marine watches, &c. were provided, and M. Dagelet the aſtronomer was particularly directed to make obſervations with M. Condamine's invariable pendulum, to determine the difference in gravity, and to aſcertain the true proportion of the equatorial to the polar diameter of the earth. It has likewiſe been made evident, that notwithſtanding all that has been done by Captain Cook, there is ſtill room for a farther inveſtigation of the geography of the northern parts of the world. The object accordingly was taken up by the empreſs of Ruſſia, who committed the care of the enterpriſe to Captain Billings an Engliſhman in her majeſty's ſervice. We ſhall only make one obſervation more concerning the benefits likely to accrue from the voyages of Captain Cook, and that is relative to the ſettlement in Botany bay. Whatever may be ſuppoſed to accrue to the nation itſelf from the ſettlement, it muſt undoubtedly give the higheſt ſatisfaction to every friend to humanity to be informed, that thus a number of unhappy wretches will be effectually prevented from returning to their former ſcenes of temptation and guilt, which may open to them the means of induſtrious ſubſiſtence and moral reformation. If the ſettlement be conducted with wiſdom and prudence, indeed it is hard to ſay what beneficial conſequences may be derived from it, or to what height it may ariſe. Rome, the greateſt empire the world ever ſaw, proceeded from an origin little, if at all, ſuperior to Botany bay. For an account of this ſettlement ſee the article *New-Holland*.

One other object remains only farther to be conſidered with regard to theſe voyages, and that is the advantages which may reſult from them to the diſcovered people. Here, however, it may perhaps be difficult to ſettle matters with preciſion. From the preceding accounts, it muſt be evident that the intentions of Captain Cook were in the higheſt degree benevolent; and if at any time the people were the ſufferers, it muſt have been through their own fault. In one inſtance indeed it might be otherwiſe, and that is with reſpect to the venereal diſeaſe. The evidence in this caſe cannot be altogether ſatisfactory. Mr Samwell, who ſucceeded Mr Anderſon as ſurgeon of the Reſolution, has endeavoured to ſhow, that the natives of the lately explored parts of the world, and eſpecially of the Sandwich iſlands, were not injured by the Engliſh; and it was the conſtant care and ſolicitude of Captain Cook to prevent any infection from being communicated to the people where he came. But whether he was univerſally ſucceſsful in this reſpect or not, it is evident that the late voyages were undertaken with a view exceedingly different from thoſe of former times. The horrid cruelties of the Spaniſh conquerors of America cannot be remembered without concern for the cauſe of religion and human nature; but to undertake expeditions with a deſign of civilizing the world, and meliorating its condition, is certainly a noble object. From the long-continued intercourſe betwixt this country and the South ſea iſlands, there connot be any doubt that ſome degree of knowledge muſt already have been communicated to them. Their ſtock of ideas muſt naturally be enlarged by the number of uncommon obſervations which has been preſented to them, and new materials furniſhed for the exerciſe of their rational faculties. A conſiderable addition muſt be made to their immediate comfort and enjoyment by the introduction of uſeful animals and vegetables; and if the only benefit they ſhould ever receive from Britain ſhould be the having obtained freſh means of ſubſiſtence, this of itſelf muſt be conſidered as a valuable acquiſition. Greater conſequences, however, may ſoon be expected. The connexion formed with theſe people may be conſidered as the firſt ſtep towards their improvement; and thus the bleſſings of civilization may be ſpread among the various tribes of Indians in the Pacific ocean, which in time may prepare them for holding an honourable place among the nations of the earth.

106
Account of Captain Clerke's voyage.

As a ſupplement to this account of the diſcoveries made by Captain Cook himſelf, we ſhall here ſubjoin a narrative of the ſubſequent part of the voyage by Captain Clerke, &c. until the return of the ſhips to England. At the time of Captain Cook's death, the great point of a north-weſt paſſage remained in ſome meaſure to be ſtill determined: for though, by the event of the former attempt, it had been rendered highly improbable that they ſhould ſucceed in this, it was ſtill reſolved to try whether or not, at certain ſeaſons of the year, the ice might not be more open than they had hitherto found it. The firſt object that naturally occurred, however, was the recovery of Captain Cook's body; for which Mr King was of opinion that ſome vigorous meaſure ought inſtantly to be purſued. His motives for this, beſides the perſonal regard he had for the captain, were to abate the confidence which muſt be ſuppoſed to enſue on the part of the natives, which would probably incline them to dangerous attempts; and this the more particularly, as they had hitherto diſcovered much leſs fear of the fire arms than other ſavage nations were accuſtomed to do. Mr Samwell alſo takes notice of the intrepidity of the natives in this reſpect; but aſcribes it, in the firſt inſtance, to ignorance of their effects; and in the next, to a notion, that as the effects of theſe arms were occaſioned by fire, they might be counteracted by water. For this purpoſe they dipped their war-mats in water; but finding themſelves equally vulnerable after this method had been purſued, they became more timid and cautious.

107
Methods taken for the recovery of Captain Cook's body.

As matters ſtood at preſent, there was even reaſon to dread the conſequences of a general attack upon the ſhips: and therefore Mr King was the more confirmed in his opinion of the neceſſity of doing ſomething to convince them of the proweſs of their adverſaries. In theſe apprehenſions he was ſeconded by the opinion of the greater part of the officers on board; and nothing ſeemed more likely to encourage the iſlanders to make the attempt than an appearance of being inclined to an accommodation, which they would certainly attribute to weakneſs or fear. Captain Clerke, however, and thoſe who were in favour of conciliatory meaſures, urged, that the miſchief was already irreparable; that the natives, by reaſon of their former friendſhip, had a ſtrong claim to the regard of the Engliſh; and that the more particularly, as the late calamitous accident did not appear to have taken its riſe from any premeditated deſign: they urged alſo the ignorance of the king concerning the theft, and the miſtake of the iſlanders who had armed themſelves on a ſuppoſition that ſome attempt would be made to carry off the king. To all this was added, that the ſhips were in want of refreſhments, particularly water; that the Reſolution's foremaſt would require ſeven or eight days before it could be properly repaired; and as the ſpring was faſt advancing, the ſpeedy proſecution of the voyage to the northward ought now to be the only object; that a vindictive conteſt with the natives might not only juſtify an imputation of needleſs cruelty, but would occaſion great delay in the equipment of the ſhips.

In conſequence of the prevalence of theſe ſentiments lenient meaſures were adopted, though the behaviour of the natives continued to be very inſolent. A great body ſtill kept poſſeſſion of the ſhore; many of whom came off in their canoes within piſtol-ſhot of the ſhips, and provoking the people by every kind of inſult and defiance. A train of negociations for Captain Cook's body took place; in which the natives ſhowed the moſt hoſtile and treacherous diſpoſition, and, as afterwards appeared, had cut the fleſh from the bones and burnt it. A piece of about ten pounds weight was brought by two natives at the hazard of their lives, who gave information that the reſt had been burnt, and that the bones were in the poſſeſſion of the king and ſome of the principal chiefs. Information was given, at the ſame time, that the chiefs were very deſirous of war, in order to revenge the death of their countrymen.

Thus it appeared that the pacific plan had anſwered no good purpoſe. No ſatisfactory anſwer had been given to the demands made of the bodies of the ſlain; nor was any progreſs made in the great work intended, viz. a reconciliation with the natives; they ſtill remained on ſhore in an hoſtile poſture, as if determined to oppoſe any endeavours that might be made by our people to land; at the ſame time that a landing was become abſolutely neceſſary, in order to complete the ſtock of water. Had this ſpiritleſs conduct been perſiſted in, there is not the leaſt doubt that neither this purpoſe or any other could have been effected. The inſolence of the natives became every day greater and greater: inſomuch that one of them had the audacity to come within muſket ſhot of the Reſolution, and, after throwing ſeveral ſtones, waved Captain Cook's hat over his head, while his countrymen on ſhore were exulting and encouraging his audacity. By this inſult the people were ſo highly enraged, that coming on the quarter-deck in a body, they begged that they might no longer be obliged to put up with ſuch reiterated provocation, but might be allowed to make uſe of the firſt opportunity of revenging the death of their captain. The neceſſity of more vigorous meaſures, therefore, being now apparent, a few diſcharges of the great guns, with the burning of a village and ſome other acts of ſeverity, at laſt produced the mangled remains of Captain Cook. They were wrapped up in a bundle, in which were found both his hands entire, which were eaſily known by a ſcar in one of them dividing the fore-finger from the thumb the whole length of the metacarpal bone. Along with theſe was the ſkull, but with the ſcalp ſeparated from it, and the bones of the face wanting; the ſcalp, with the ears adhering to it, and the hair cut ſhort; the bones of both the arms, and the ſkin of the fore arms hanging to them; the bones of the thighs and legs joined together, but without the feet. The ligaments of the joints were obſerved to be entire; the whole ſhowing evident marks of being in the fire, except the hands which had the fleſh remaining upon them, and were cut in ſeveral places and crammed with ſalt, moſt probably for the purpoſe of preſerving them. The ſkull was not fractured; but the ſcalp had a cut in the back part of it. The lower jaw and feet were wanting, having been ſeized by different chiefs.

108
His remains at laſt obtained.

109
Unſucceſsful attempts to make farther diſcoveries.

Having accompliſhed the purpoſes of their ſtay in this place, Captain Clerke ſet ſail from Karakakooa bay in O-why-hee towards Mowee, with a deſign to explore the coaſts of that iſland more fully than had been done, but were unable to accompliſh their purpoſe: nor indeed was it in their power to accompliſh any diſcovery of conſequence among theſe iſlands. The only intelligence worth mentioning which they were able to procure was, that wars had enſued about the property of the goats which were left by Captain Cook on the iſland of Oneeheow, as has been already mentioned, and that during the conteſt all theſe poor animals, who had already begun to multiply, were deſtroyed; ſo that the benevolent attempts of our illuſtrious navigator in favour of theſe iſlanders had proved abortive.

On quitting the iſland of Oneeheow, our navigators ſet ſail for another named Modoopappa, which they were aſſured by the natives lay within five hours ſailing of Tahoora, a ſmall iſland in the neighbourhood of Oneeheow. In this they proved unſucceſsful; on which it was determined to ſteer for the coaſt of Kamtſchatka. In the paſſage thither they arrived at the place where De Gama is ſaid to have diſcovered a great extent of land; but of this they could diſcover no appearance. This imaginary continent is ſaid to have been diſcovered by a navigator called John de Gama, but who ſeems alſo to have been imaginary, as no perſon can find out either the country where he lived, or the time when he made the diſcovery. We are informed by Muller, that the firſt account of it was publiſhed by Texeira in a chart of 1649, who places it between the latitude of 44 and 45 degrees, and about 160. eaſt longitude, and calls it "land ſeen by John de Gama, in a voyage from China to New Spain." By the French geographers it is removed five degrees farther to the eaſt. When they arrived at Kamtſchatka they were entertained in the moſt hoſpitable manner, and furniſhed with every thing that could be procured in that deſert and barren region. "In this wretched extremity of the earth (ſays the narrator of the voyage), beyond conception barbarous and inhoſpitable, out of the reach of civilization, bound and barricaded with ice, and covered with ſummer ſnow, we experienced the tendereſt feelings of humanity, joined to a nobleneſs of mind and elevation of ſentiment which would have done honour to any clime or nation." From Major Behm, in particular, they received ſo many and ſo great obligations, that an handſome acknowledgment was made him by the Royal Society, as has been already obſerved. Even the ſailors were ſo ſtruck with gratitude, that they voluntarily requeſted that their allowance of grog might be withheld, in order to compliment the garriſon of Bolcheretſk with the ſpirits; ſaying, that they knew brandy was extremely ſcarce in that country, the ſoldiers on ſhore having offered four roubles a bottle for it. The officers, however, would not allow them to ſuffer by their generoſity in this inclement country and ſeaſon of the year (the month of March not being yet expired); but in room of the ſmall quantity of brandy which Major Behm conſented to accept, ſubſtituted an equal quantity of rum.

111
Tſchutſki ſubmit to the empreſs.

It is worth obſerving, that the kindneſs with which the empreſs had ordered the Britiſh navigators to be treated in this part of her dominions was amply rewarded, even with no leſs than the addition of a new kingdom to the Ruſſian empire, which hitherto her arms had not been able to ſubdue. Among the northern Aſiatics none had been able to maintain their independence except the Tſchutſki, who inhabit the north-eaſt extremity of the continent. No attempt to ſubdue theſe people had been made ſince the year 1750, when the Ruſſian forces had at laſt been obliged to retreat, after having loſt their commanding officer. The Ruſſians afterwards removed their frontier fortreſs from the river Anadyr to the Ingiga, which runs into the northern extremity of the ſea of Okotſk, and gives its name to a gulf to the weſt of the ſea of Penſhinſk. On the day that Captains Clerk and Gore arrived at Bolcheretſk, Major Behm received diſpatches from this fort, acquainting him that a party of the Tſchutſki had been there with voluntary offers of friendſhip and a tribute. That on aſking the reaſon of ſuch an unexpected alteration in their ſentiments, they had acquainted his people that two large Ruſſian boats had viſited them towards the end of the preceding ſummer; that they had been ſhown the greateſt kindneſs by the people who were in them, and had entered into a league of amity with them; and that, in conſequence of this, they came to the Ruſſian fort in order to ſettle a treaty upon terms agreeable to both nations. This incident had occaſioned much ſpeculation, and could never have been underſtood without the aſſiſtance of thoſe who were now preſent; the large *Ruſſian boats* having been in truth no other than the Reſolution and Diſcovery, under Captains Cook and Clerke.

112
Vaſt quantity of fiſh.

About the middle of May the ſnow began to melt very faſt in this inhoſpitable region, and the ſhips being now on their paſſage northward, met with an excellent opportunity of ſupplying themſelves with fiſh. The beach was cleared of ice on the 15th of the month; from which time vaſt quantities came in from every quarter. Major Behm had ordered all the Kamtſchadales to employ themſelves in the ſervice of the Engliſh ſhips; ſo that often they found it impoſſible to take on board the quantities that were ſent. They chiefly conſiſted of herrings, trout, flat fiſh, and cod. Theſe fiſh were here found in ſuch plenty, that once the people of the Diſcovery ſurrounded ſuch an amazing quantity with the ſeine, that they were obliged to throw out a very conſiderable number, leſt the net ſhould have been broken to pieces; and the cargo was ſtill ſo abundant, that, beſides having a ſtock for immediate uſe, they filled as many caſks as they could conveniently ſpare for ſalting; and after ſending on board the Reſolution a tolerable quantity for the ſame purpoſe, they left behind ſeveral buſhels on the beach.

113
Spirituous liquors pernicious in the ſea-ſcurvy.

While they remained in this country an opportunity offered of obſerving the pernicious effects of ſpirituous liquors in producing the ſea-ſcurvy. All the Ruſſian ſoldiers were in a greater or leſſer degree afflicted with that diſorder, ſome of them being in the laſt ſtage of it; and it was particularly obſerved that a ſerjeant, with whom our people had kept up a moſt friendly intercourſe, had, *in the courſe of a few days*, brought upon himſelf the moſt alarming ſcorbutic ſymptoms, by drinking too freely of the liquors with which he had been preſented by the Engliſh. Captain Clerke ſoon relieved them, by putting them under the care of the ſurgeons of the ſhips, and ſupplying them with ſour-krout, and malt for ſweet-wort. In conſequence of this a ſurpriſing alteration was ſoon obſerved in the figures of moſt of them: and their ſpeedy recovery was principally attributed to the ſweet wort.

114
Eruption of a volcano.

On the 12th of June they began to proceed northward along the coaſt of Kamtſchatka, and three days after had an opportunity of obſerving an eruption of one of the volcanoes of that peninſula. On the 15th before day-light, they were ſurpriſed with a rumbling noiſe like diſtant thunder; and when the day appeared, found the decks and ſides of the ſhips covered near an inch thick with fine duſt like emery. The air was at the ſame time loaded and obſcured with this ſubſtance; and in the neighbourhood of the volcano itſelf it was ſo thick that the body of the hill could not be diſcovered. The exploſion became more loud at 12 o'clock, and during the afternoon, being ſucceeded by ſhowers of cinders, generally of the ſize of peaſe, though ſome were as large as hazel-nuts. Along with theſe there alſo fell ſome ſmall ſtones which had undergone no alteration from the action of the fire. In the evening there were dreadful claps of thunder, with bright flaſhes of lightning, which, with the darkneſs of the ſky, and the ſulphureous ſmell of the air, produced a moſt awful and tremendous effect. The ſhips were at this time about 24 miles diſtant from the volcano; and it appeared that the volcanic ſhower had been carried to a ſtill greater diſtance, as they next day found the bottom of the ſea to conſiſt of ſuch ſmall ſtones as had fallen upon the decks of the ſhips. The mountain was ſtill obſerved to be in a ſtate of eruption on the 18th.

115
Voyages to the northward.

For ſome time Captain Clerke kept the coaſt of Kamtſchatka in view, with a deſign to make an accurate ſurvey of it; but in this he was diſappointed by foggy and ſqually weather; however, he determined the poſition of ſome remarkable promontories, and at laſt finding the ſeaſon too far advanced to accompliſh his deſign, ſet ſail for Beering's ſtraits, chiefly with a view to aſcertain the ſituation of the projecting points of the coaſt.

On the 3d of July our navigators came in ſight of the iſland of St Lawrence, and another which was ſuppoſed to lie between it and Anderſon's iſland. The latter being entirely unknown to Captain Clerke, he was inclined to have approached it, but was unable to effect his purpoſe. All theſe iſlands as well as the coaſt of the Tſchutſki on the continent were covered with ſnow, and had a diſmal appearance.

In the preceding year Captain Cook had determined the ſituation of the iſlands of St Diomede to be in 65° 48′ latitude; but now being ſomewhat at a loſs to reconcile this with the poſition of the continent, they ſtood for ſome time over to the latter, till fully convinced of the accuracy of the former obſervation. At this time they approached within two or three leagues of the eaſtern cape of Aſia, which is an elevated round head of land extending about five miles from north to ſouth, and forms a peninſula connected with the continent by a narrow iſthmus of low land. It has a bold ſhore, and three lofty detached ſpiral rocks are ſeen off its northern part. It was ſtill encompaſſed with ice, and covered with ſnow. Here they found a ſtrong current ſetting to the northward, which at noon had occaſioned an error in the computation of the latitude of no leſs than 20 miles. A ſimilar effect had been obſerved the preceding year in paſſing this ſtrait. On ſteering to the north-eaſt the weather cleared up, ſo that they had a view of the eaſtern cape of Aſia, Cape Prince of Wales on the weſtern coaſt of America, with a remarkable peaked hill on the latter, and the two iſlands of St Diomede lying between them. Here they met with great numbers of very ſmall hawks, having a compreſſed bill rather large in proportion to the body; the colour dark brown, or rather black, the breaſt whitiſh, and towards the abdomen of a reddiſh hue.

116 Are ſtopped by the ice.

On the 6th of July, at 12 o'clock, the ſhips were in N. Lat. 67. 0. E. Long. 191. 6. when having already paſſed many large pieces of ice, and obſerved that in ſeveral places it adhered to the continent of Aſia, they were ſuddenly ſtopped about three in the afternoon by an extenſive body, which ſtretched towards the weſt. By this their hopes of reaching any higher latitude than what had been attained laſt year were conſiderably diminiſhed; but finding the courſe obſtructed on the Aſiatic ſide, they proceeded to the north-eaſtward, in order to explore the continent of America between the latitudes of 68 and 69°; which had laſt year been found impracticable on account of the foggy weather; but in this alſo they were partly diſappointed; for on the 7th, about ſix in the morning, they met with another large body of ice ſtretching from north-weſt to ſouth-eaſt; but not long afterwards, the horizon becoming clear, they had a view of the American coaſt at the diſtance of about ten leagues, extending from north-eaſt by eaſt, to eaſt, and lying between N. Lat. 68° and 68° 20′. As the ice was not very high, the view extended a great way over it, ſo that they could perceive it exhibiting a compact ſolid ſurface, and apparently adhering to the land. Soon after the weather became hazy, ſo that they loſt ſight of the land; and it being impoſſible to get nearer, they continued to ſteer northward cloſe by the ſide of the ice. This courſe was continued till next morning, during which time the ſhips paſſed ſome drift wood; but the morning following, the wind ſhifting to the north, they were obliged to ſtand to the weſtward. At two in the afternoon they were again cloſe to an immenſe expanſe of ice; which from the maſt-head ſeemed to conſiſt of very large compact bodies, united towards the exterior edge, though in the interior parts ſome pieces floated in the water; it extended from weſt-ſouth-weſt to north-eaſt by north. There was now a neceſſity for ſteering towards the ſouth, as the ſtrong northerly winds had drifted down ſuch numbers of looſe pieces, that they had encompaſſed the ſhips for ſome time, and it was impoſſible to avoid very ſevere ſtrokes while ſailing among them. Thus, however, they reached the latitude of 69. 12. and E. Long. 188. 5.; but having now ſailed almoſt 40 leagues to the weſt along the edge of the ice without perceiving any opening, Captain Clerke determined to bear away ſouth by eaſt, the only quarter which was clear at preſent, and to wait till the ſeaſon was ſomewhat farther advanced before any further attempts were made. The intermediate time he propoſed to employ in ſurveying the bay of St Lawrence, and the coaſt ſituated to the ſouthward of it; as it muſt be a great ſatisfaction to have a harbour ſo near in caſe of the ſhip's receiving any damage from the ice; and the captain was alſo deſirous of paying another viſit to the Tſchutſki, eſpecially in conſequence of the accounts of them that had been given by Major Behm. 117 Remarkable affection of the ſea-horſes towards the young. In this navigation they killed ſeveral ſea-horſes, and had an opportunity of obſerving the ſtrength of parental affection in thoſe monſtrous animals. On the approach of the boats towards the ice, all of them took their young ones under their fins, and attempted to make their eſcape with them into the ſea. Some whoſe cubs were killed or wounded, and left floating upon the ſurface of the water, roſe again, and carried them down, ſometimes juſt as they were on the point of being taken into the boat; and could be traced bearing them to a conſiderable diſtance through the water, which was ſtained with their blood. They were afterwards obſerved bringing them at intervals above the ſurface, and again plunging under its ſurface with an horrid bellowing; and one female, whoſe young one had been killed and taken on board, became ſo furious, that ſhe ſtruck her tuſks through the bottom of the cutter.

118 The ſhips finally ſtopped by ice.

Our navigators ſtill found themſelves diſappointed in their attempts. On approaching the coaſt of the Tſchutſki they met with a large and compact body of ice, extending to the north-eaſt, ſouth-weſt, and ſouth-eaſt, as far as the eye could reach; ſo that they were again obliged to ſail back to the northward. Here alſo their courſe was ſoon ſtopped; for, on the 13th, being in N. Lat. 69. 37. and about the middle of the channel between the two continents, they once more fell in with a compact body of ice, of which they could perceive no limit. Captain Clerke therefore determined to make a final attempt on the coaſt of America, the paſſage northward having been found laſt year practicable much farther on that than the Aſiatic ſide. Thus they attained the latitude of 70. 8. at the diſtance, as was ſuppoſed, of 25 leagues from the coaſt of America; and ſome days after got about three minutes farther to the northward, about the diſtance of ſeven or eight leagues from the Icy Cape. This, however, was the utmoſt limit of the voyage to the north-eaſt; and they were ſoon obliged to relinquiſh

119 Dangerous ſituation of the Diſcovery.

quiſh all hopes of proceeding farther on the American ſide. Another effort was ſtill reſolved on to try the practicability of a north-weſt paſſage; and for this purpoſe our navigators altered their direction on the 21ſt of July, paſſing through a great quantity of looſe ice. About ten at night the main body was diſcovered at a very ſmall diſtance, ſo that they were obliged to proceed to the ſouthward. During this perilous navigation, the Diſcovery, after having almoſt got clear out from the ice, became ſo entangled by ſeveral large pieces, that her progreſs was ſtopped, and ſhe immediately dropped to leeward, falling broadſide foremoſt on the edge of a conſiderable body of ice, on which ſhe ſtruck with violence, there being an open ſea to windward. At length the maſs was either broken or moved ſo far, that the crew had an opportunity of making an effort to eſcape. But unluckily, before the ſhip gathered way ſufficient to be under command, ſhe fell to leeward a ſecond time upon another piece of ice; and the ſwell rendering it unſafe to lie to windward, and finding no proſpect of getting clear, they puſhed into a ſmall opening, and made the veſſel faſt to the ice with hooks. Here the Reſolution for ſome time loſt ſight of her conſort, which occaſioned no ſmall uneaſineſs in both veſſels; but at length, on a change of wind, the Diſcovery, ſetting all her ſails, forced a paſſage, though not without loſing a conſiderable part of her ſheathing, and becoming very leaky by reaſon of the blows ſhe had received.

Thus the two veſſels continued to make every effort to penetrate through the immenſe quantities of ice with which thoſe ſeas are filled winter and ſummer, but without ſucceſs. Captain Clerke therefore finding that it was impoſſible either to get to the northward, or even to reach the Aſiatic continent, the ſhips being alſo greatly damaged, determined to proceed ſouthward to the bay of Awatſka, on the Kamtſchadale coaſt, to refit, and afterwards take a ſurvey of the coaſts of Japan before the winter ſhould ſet in.

120 Of the extent of the Aſiatic continent to the northward.

During this navigation, two general concluſions were adopted relative to the extent of the Aſiatic coaſt, in oppoſition to the opinion of Mr Muller. One is, that the promontory, called the *Eaſt Cape*, is in reality the moſt eaſterly point of Aſia; and that no part of that quarter of the globe extends farther than the longitude of 190° 22′ E. The other concluſion is, that the latitude of the moſt north-eaſterly point of Aſia does not exceed 70°. N. but is rather ſomewhat below it. As the preſent diſcoveries, however, were terminated on the Aſiatic ſide on the 69th degree of latitude, the probable direction of the coaſt afterwards can only be conjectured. The only ſources of knowledge in this caſe are the Ruſſian charts and journals, and theſe in general are ſo defective and contradictory, that the particulars of their real diſcoveries can ſcarce be collected. Hence the Ruſſian geographers are greatly divided in their opinions concerning the extent and figure of the peninſula of the Tſchutſki. Mr Muller, in a map publiſhed 1751, ſuppoſes it to extend north eaſt as far as the latitude of 75°, and E. Long. 19°, ending in a round cape, which he calls *Tſchukotſkoi Noſs*. To the ſouthward of this cape he ſuppoſes the coaſt to form a bay to the weſt, bounded in the latitude of 67° 18′ by Serdze Kamen, the moſt northerly point obſerved by Beering in his expedition in 1728. A new form is given to the whole peninſula in a map publiſhed by the academy at Peterſburgh in 1776. Here its moſt north-eaſterly extremity is placed in N. Lat. 73°. E. Long. 178. 30.; and its moſt eaſterly point in N. Lat. 65. E. Long. 189. 30. All the other maps vary between theſe two ſituations: and the only thing in which all of them agree is the poſition of the Eaſt cape in N. Lat. 66. The form of the coaſt, however, is very erroneous in the map publiſhed by the academy, and may be entirely diſregarded. In Mr Muller's map, the northern part of the coaſt has ſome reſemblance to that laid down in Captain Cook's and Clerke's ſurvey, as far as the latter extends; only that Mr Muller does not make it trend ſufficiently to the weſt, but ſuppoſes it to recede only five degrees of longitude between the latitudes of 66° and 69°; whereas it really recedes almoſt ten.

We muſt next examine Mr Muller's authority for ſuppoſing the coaſt to bend round to the north and north-eaſt in ſuch a manner as to form a large promontory. Mr Coxe, whoſe accurate reſearches into this matter muſt give great weight to his opinion, thinks, that the extremity of the promontory was never doubled by any perſon except Deſhneff and his party; who ſailed, in the year 1648, from the river Kovyma, and are imagined to have got round to the river Anadyr. The account of this voyage, however, gives no geographical delineation of the coaſt, ſo that its figure muſt be determined by other circumſtances; and from theſe it evidently appears, that the Tſchukotſkoi Noſs of Deſhneff is in reality the Eaſt cape of Captain Cook. Speaking of this noſs, he ſays, that a perſon, with a favourable wind, may ſail from the iſthmus to the Anadyr in three days and three nights. This agrees entirely with the ſituation of the Eaſt cape, which is about 120 leagues from the mouth of the river Anadyr; and there being no other iſthmus to the north between that and the latitude of 69°, it ſeems evident, that by this deſcription he certainly means either the Eaſt cape or ſome other ſituated to the ſouthward of it. In another place he ſays, that oppoſite to the iſthmus there are two iſlands upon which ſome of the Tſchutſki nation were obſerved, having pieces of the teeth of ſea-horſes fixed in their lips; and this exactly coincides with the two iſlands that lie to the ſouth-eaſt of the Eaſt cape. Our navigators indeed did not obſerve any inhabitants upon theſe iſlands; but it is by no means improbable, that ſome of thoſe of the American coaſt, whom the above deſcription perfectly ſuits, might have accidentally been there at the time, and been miſtaken for a tribe of Tſchutſki.

Other circumſtances, though leſs deciſive than thoſe juſt mentioned, concur in the ſame proof. Deſhneff ſays, that in ſailing from the Kovyma to the Anadyr, a great promontory, which projects far into the ſea, muſt be doubled; and that this promontory extends between north and north-eaſt. From theſe expreſſions, perhaps, Mr Muller was induced to repreſent the country of the Tſchutſki in the form we find in his map; but if he had been acquainted with the poſition of the Eaſt cape as determined by Captain Cook, and the ſtriking agreement between that and the promontory or iſthmus in the circumſtances above-mentioned, is it is moſt probable that he would not have deemed theſe expreſſions of ſufficient weight to authorize his extending the north-eaſtern extremity of Aſia either as far to the north or to the eaſt as he has done.

Another authority uſed by Mr Muller ſeems to have been the depoſition of the Coſſack Popoff, taken at the Anadirſkoi Oſtrog in 1711. Popoff was ſent by land, in company with ſeveral others, to demand tribute of the independent Tſchutſki tribes, who inhabited the country about the Noſs. In the account of this journey, the diſtance betwixt Anadirſk and Tſchukotſkoi Noſs is repreſented as a journey of ten weeks with loaded rein-deer. From ſuch a vague account, indeed, we can judge but very little: but as the diſtance between the Eaſt cape and Anadirſk does not exceed 200 leagues, and conſequently might be accompliſhed in the ſpace above mentioned at the rate of 12 or 14 miles a day, we cannot reckon Popoff's account of its ſituation inconſiſtent with the ſuppoſition of its being the Eaſt cape. It may likewiſe be obſerved, that Popoff's route lay along the foot of a rock named *Matkol*, ſituated at the bottom of a ſpacious gulf, which Muller ſuppoſes to have been the bay he lays down between the latitudes of 66° and 72°; and he accordingly places the rock Matkol in the centre of it; but it ſeems more probable that it might be a part of the gulf of Anadyr, which they would undoubtedly paſs in their journey towards the Eaſt cape.

But what ſeems to put the matter beyond all doubt, and to prove that the cape which Popoff viſited cannot be to the northward of 69° Lat. is that part of his depoſition which relates to an iſland lying off the Noſs, from whence the oppoſite coaſt might be diſcerned; for as the oppoſite continents, in the latitude of 69°, diverge ſo far as to be upwards of 100 leagues diſtant, it is highly improbable that the Aſiatic coaſt ſhould again trend eaſtward in ſuch a manner as to come almoſt in ſight of that of America. As an additional proof of the poſition in queſtion, we may obſerve, that the Tſchukotſkoi Noſs is conſtantly laid down as dividing the ſea of Kovyma from that of Anadyr; which could not poſſibly be the caſe if any large cape had projected to the north-eaſt in the higher latitudes.

The next queſtion to be determined is, to what degree of latitude the northern coaſt of Aſia extends before it inclines directly weſtward? Captain Cook was always ſtrongly inclined to believe, that the northern coaſt of this continent, from the Indigirka eaſtward, has hitherto been uſually laid down above two degrees to the northward of its true ſituation; for which reaſon, and on the authority of a map that was in his poſſeſſion, as well as from intelligence received at Oonalaſhka, he placed the mouth of the Kovyma in the latitude of 68°. Should he be right in his conjecture, it is probable that the coaſt of Aſia does not anywhere extend beyond the latitude of 70° before it trends to the weſt; and conſequently our navigators muſt have been only one degree from its northern extremity. This ſeems to be confirmed by the ſilence of the Ruſſian navigators concerning any extent of continent to the northward of Shelatſkoi Noſs; nor do they mention any remarkable promontory, except the Eaſt cape, between the Anadyr and the Kovyma. Another particular which Deſhneff relates may perhaps be deemed a farther confirmation of this opinion, viz. that he met with no obſtruction from ice in ſailing round the northern extremity of Aſia; though he adds, that this ſea is not at all times ſo free of it, which indeed appears evidently to be the caſe. That part of the continent which lies between Cape North and the mouth of the Kovyma is about 125 leagues in extent. A third part of this ſpace, from Kovyma eaſtward, was explored in the year 1723 by Feodot Amoſſoff, who informed Mr Muller that its direction was eaſterly. Since that time it has been ſurveyed with ſome accuracy by Shalauroff, whoſe chart makes it trend north-eaſt-by-eaſt as far as Shelatſkoi Noſs, which he places at the diſtance of about 43 leagues eaſt of the Kovyma. The ſpace, therefore, between the Noſs and Cape North, ſomewhat more than 80 leagues, is the only part of the Ruſſian dominions now remaining unexplored. But if the Kovyma be erroneouſly laid down in point of longitude as well as latitude, a ſuppoſition far from being improbable, the extent of the undiſcovered coaſt will be conſiderably diminiſhed.

The following are the reaſons why it may be ſuppoſed that the mouth of the Kovyma is placed too far to the weſtward in the Ruſſian charts: 1. Becauſe the accounts that have been given of the navigation of the Frozen ocean from that river round the north-eaſtern extremity of Aſia to the gulf of Anadyr, do not agree with the ſuppoſed diſtance between thoſe places. 2. Becauſe the diſtance from the Anadyr to the Kovyma over land is by ſome Ruſſian travellers repreſented as a journey of no very great length, and eaſily performed. 3. Becauſe the coaſt from the Shelatſkoi Noſs of Shalauroff appears to trend directly ſouth-eaſt towards the Eaſt cape. From all which it may be inferred, with ſome degree of probability, that only 60 miles of the northern Aſiatic coaſt remain to be explored.

121
Impracticability of a north-weſt or north-eaſt paſſage into the Pacific ocean.

With regard to a north-weſt paſſage from the Atlantic into the Pacific ocean, it is highly probable that no ſuch thing exiſts to the ſouthward of the 56th degree of latitude. If, in reality, it exiſts anywhere, it muſt certainly be either through Baffin's bay, or by the north of Greenland in the weſtern hemiſphere, or in the eaſtern, through the Frozen ſea to the north of Siberia; ſo that in whichever continent it is ſeated the navigator muſt paſs through Beering's ſtraits.

All that remains now to be conſidered therefore is, the impracticability of penetrating into the Atlantic ocean, through theſe ſtraits. From the voyages of our navigators it appears, that the ſea to the northward of Beering's ſtraits is more free from ice in Auguſt than in July, and perhaps may be ſtill more ſo in ſome part of September. But after the autumnal equinox the length of the day diminiſhes ſo faſt, that no farther thaw can be expected; and it would be unreaſonable to attribute ſo great an effect to the warmth of the laſt fortnight of September as to imagine it capable of diſperſing the ice from the moſt northern part of the American coaſt. Even admitting this to be poſſible, it muſt at leaſt be allowed that it would be highly imprudent to endeavour to avoid the Icy cape, by running to the known parts of Baffin's bay, a diſtance of about 1260 miles, in ſo ſhort a time as that paſſage can be ſuppoſed to be open. On the ſide of Aſia there appears ſtill leſs probability of ſucceſs, as appears from the teſtimony of the Ruſſian as well as the Engliſh navigators. The voyage of Deſhneff indeed proves the poſſibility of circumnavigating the north-eaſtern extremity of Aſia; but even this affords a very ſlender foundation to hope for any great benefit, as no perſon beſides himſelf appears to have ſucceeded in the attempt, though more than a century and a half has now elapſed ſince the time of his voyage. But even ſuppoſing that, in ſome very favourable ſeaſon, this cape might be doubled, ſtill the cape of Taimura remains, extending as far as the 78th degree of latitude, and round which none pretend ever to have ſailed.

Theſe arguments ſeem concluſive againſt any expectation of a north-weſt or north-eaſt paſſage to the Eaſt Indies, unleſs on the ſuppoſition of an open ſea very near the polar regions. The probability of getting into the polar ſeas is conſidered under the article Pole; and indeed from what has already been advanced muſt appear very little. Waving this ſubject therefore at preſent, we ſhall return to the remarks made by our navigators during their ſecond voyage.

122
Remarks during the voyage of Captain Clerke towards the Icy ſea.

In this they did little more than confirm what had been obſerved during the firſt: for it never was in their power to approach the continent of Aſia in any higher latitude than 67°, nor that of America in any part, excepting a few leagues, between 68° and 68° 20′, which they had not ſeen before. In both years the ice was met with ſooner on the Aſiatic than the American coaſt; but in 1779 they met with it in lower latitudes than in 1778. As they proceeded northward, the ice was found univerſally more compact and ſolid, though they were aſcertained at the ſame time that the greateſt part of what they met with was moveable. Its height on a medium was eſtimated at eight or ten feet; though ſome of the higheſt might be about 16 or 18. The currents were generally at the rate of one mile in the hour, and more generally ſet from the ſouth-weſt than from any other quarter. Their force, however, was ſo inconſiderable, whatever their direction might be, that no concluſion could poſſibly be drawn from them concerning the exiſtence or non-exiſtence of a northern paſſage. With regard to the temperature of the weather, July was found much colder than Auguſt. In the former, the thermometer was once at 20°, and very frequently at 30°; whereas during the laſt year it was very uncommon in Auguſt to have it as low as the freezing point. High winds were experienced in both ſeaſons, all of which blew from the ſouth-weſt. The air was foggy whenever the weather became calm; but the fogs were obſerved to accompany ſoutherly winds much more than others.

The ſtraits, in the neareſt approach of the continents to each other, in the latitude of 66°, are about 13 leagues over; beyond which they diverge to N. E. by E. and W. N. W.; ſo that in the latitude of 69°, their diſtance from each other is about 300 miles. A great reſemblance is obſerved betwixt the continents on both ſides of the ſtraits. Both are deſtitute of wood; the ſhores are low, with mountains further inland, riſing to a great height. The ſoundings in the mid way between them were from 29 to 30 fathoms, gradually decreaſing as either continent was approached; with this difference, however, that the water was ſomewhat ſhallower on the coaſt of America than that of Aſia, at an equal diſtance from land. The bottom, towards the middle, was a ſoft ſlimy mud; and near either ſhore was a browniſh ſand intermixed with a few ſhells and ſmall fragments of bones. There was but little tide or current, and what there was came from the weſt.

123
Death of Captain Clerke. See *Clerke*.

Before the ſhips could reach the peninſula of Kamtſchatka, Captain Clerke expired; in conſequence of which the command of the Diſcovery devolved upon Mr King, Captain Gore being now the ſuperior officer. On the return to Kamtſchatka, Captain Clerke was buried in the ſpot on which a church was to be erected; it having been his own deſire to be interred in the church.

124
Return to Kamtſchatka, with a deſcription of the bay of Awatſka.

By the time they arrived at this peninſula, the face of the country was greatly improved; the fields being covered with the moſt lively verdure, and every plant in the moſt flouriſhing ſtate. The eruption of the volcano which they had obſerved on their laſt departure from Kamtſchatka, had done little or no damage, notwithſtanding its violence. Several ſtones had fallen about the ſize of a gooſe's egg, but none larger. At this viſit it was obſerved by our navigators, that the complexions of the Ruſſians ſeemed to be much more unhealthy and ſallow than when they ſaw them formerly; and the Ruſſians made the ſame obſervation upon the complexions of their gueſts. As no certain cauſe for this alteration could be perceived, the blame was by both parties laid on the verdure of the country; which, by contraſting itſelf with the colour of the people, made the latter appear to diſadvantage.

Having repaired as well as they could the damages ſuſtained by the ſhips among the ice, our navigators now began to proceed on their voyage ſouthward; but the ſhattered condition of their veſſels, with the little time they had now to ſpare on voyages of diſcovery, after having been ſo long at ſea, now rendered them much leſs ſucceſsful than formerly. Before leaving the peninſula, however, they took care to give ſuch a deſcription of the bay of Awatſka as muſt be of great ſervice to future navigators. This bay lies in 52. 51. N. Lat. and 158. 48. E. Long. in the bight of another bay formed by Cape Gavareea to the ſouth, and Cheeponſkoi Noſs to the north. The latter of theſe bears from the former N. E. by N. and is 32 leagues diſtant. From Cape Gavareea to the entrance of Awatſka bay the coaſt takes a northerly direction, and extends about 11 leagues. It conſiſts of a chain of rugged cliffs and rocks, and in many parts preſents an appearance of bays or inlets; but on a nearer view, low grounds were perceived by which the headlands were connected. From the entrance of Awatſka bay, Cheeponſkoi Noſs bears E. N. E. diſtant 17 leagues. The ſhore on this ſide is flat and low, with hills behind gradually riſing to a conſiderable height. The latitude of Cape Gavareea is 52. 21. By this remarkable difference of the land on both ſides the cape, navigators may be directed in their courſe towards it from the ſouthward. When they approach it from the northward, Cheeponſkoi Noſs becomes very conſpicuous; it being a high projecting headland, and united to the continent by a large extent of level ground lower than the Noſs: and preſents the ſame appearance whether viewed from the north or ſouth. Should the weather happen to be ſufficiently clear to admit a view of the mountains both on the ſea coaſt and in the neighbourhood, the ſituation of Awatſka bay may be known by the two high ones to the ſouth of it. That neareſt the bay is in the form of a ſugar loaf, the other flat at top, and not quite ſo high. Three very conſpicuous mountains appear on the north ſide of the bay; of which that to the weſt appears to be the higheſt; the next, being a volcano, is readily known by the ſmoke which it emits; the third is the moſt northerly, and might properly be called a cluſter of mountains, as it preſents ſeveral flat tops to view. When got within the capes, the entrance of the bay of Awatſka to the north is pointed out by a lighthouſe on a perpendicular headland. Many ſunken rocks lie to the eaſtward of this headland, ſtretching two or three miles into the ſea; and which with a moderate ſea or ſwell will always ſhow themſelves. A ſmall round iſland lies four miles to the ſouth of the entrance, principally compoſed of high pointed rocks, one of which is very remarkable. The entrance into the bay is at firſt about three miles wide, and one and an half in the narroweſt part; the length is four miles in a north-weſt direction. Within the mouth is a noble baſon about 25 miles in circumference; in which are the harbours of Rakoweera to the eaſt, Tarcinſka to the weſt, and St Peter and St Paul to the north.

125
Account of the voyage from the time of leaving Kamtſchatka.

On leaving Kamtſchatka, it was unanimouſly judged improper to make any attempt to navigate the ſeas between the continent of Aſia and Japan. Inſtead of this, it was propoſed to ſteer to the eaſtward of that iſland, and in the way thither to ſail along the Kuriles; examining particularly thoſe that are ſituated neareſt to the northern coaſt of Japan, which are ſaid to be conſiderable, and neither ſubject to the Ruſſians nor Japaneſe. In caſe they ſhould have the good fortune to meet with ſome ſecure and commodious harbour in one of theſe iſlands, it was ſuppoſed that they might prove of conſiderable importance, as convenient places for ſhelter for ſubſequent navigators, who might be employed in exploring theſe ſeas, as the means of producing a commercial intercourſe among the adjacent dominions of the two above-mentioned empires. The next object was to take a ſurvey of the coaſts of the iſlands of Japan; after which they deſigned to ſail for the coaſt of China as far north as poſſible, and then ſail along it ſouthward to Macao.

In purſuance of this plan, they ſailed along the coaſt of Kamtſchatka, till they came to the ſouthern point called *Cape Lopatka*, whoſe ſituation they determined to be in Lat. 51. 0. E. Long. 156. 45. To the north-weſt they obſerved a very lofty mountain whoſe ſummit was loſt in the clouds; and the ſame inſtant the firſt of the Kurile iſlands, named *Shoomſka*, made its appearance in the direction of weſt, half ſouth. The paſſage betwixt the ſouthern extremity of Cape Lopatka and the iſland of Shoomſka, though only one league in breadth, is extremely dangerous, both on account of the rapidity of the tides, and of the ſunk rocks which lie off the cape. In the courſe of this voyage, they had occaſion to obſerve, that a violent ſwell from the north-eaſt frequently took place, though the wind had been for ſome time in the weſtern quarter; a circumſtance for which they ſeem to have been altogether unable to account.

The tempeſtuous weather which now occurred, prevented any diſcoveries from being made among the Kurile iſles; however, they again ſailed over the ſpace aſſigned to the land of De Gama, without being able to find it; and, from comparing ſeveral accounts of the Ruſſian navigators with one another, it was judged extremely probable, that the land of Jeſo, ſo frequently laid down in former maps, is no other than the moſt ſoutherly of the Kurile iſles. On coming in view of the coaſt of Japan, they had the mortification to find that they could not approach the land by reaſon of the tempeſtuous weather and bad ſtate of the ſhips; the coaſts of theſe iſlands being extremely dangerous. Paſſing from thence in queſt of the Baſhee iſlands, they found amazing quantities of pumice-ſtone floating in the ſea; ſo that they ſeemed inclined to believe, with Mr Muller, that if there had formerly been any part of the continent, or large iſland, called the *Land of Jeſo*, it muſt have diſappeared in a volcanic convulſion; which alſo muſt have been the caſe with that called the *Company's Land* and *Staten iſland*. Though they had not the good fortune to find the Baſhee iſlands, they diſcovered one in 24. 48. N. Lat. 141. 20. E. Long. which from its appearance, and the ſulphureous ſmell emitted by it, they named *Sulphur iſland*. After this nothing remarkable occurred till their arrival at Canton in China, where, having ſtaid for ſome time in order to put their ſhips in repair, they at laſt ſet ſail for Britain; but through ſtreſs of weather were driven as far north as Stromneſs in Orkney. From thence Captain Gore ſent a diſpatch to the lords of the admiralty to inform them of his arrival; and on the 4th of October 1780 the ſhips reached the Nore, after an abſence of four years, two months, and twenty-two days.

COOKERY, the art of preparing and dreſſing victuals for the table: An art in its ſimpleſt and ordinary modes, ſufficiently familiar to every houſekeeper; and, in its luxurious refinements, too copiouſly detailed in manuals and directories publiſhed for the purpoſe, to require any enlargement here, were it even a topic that at all deſerved conſideration in a work of this nature.

COOLERS, in *Medicine*, thoſe remedies which were ſuppoſed to produce an immediate ſenſe of cold, being ſuch as have their parts in leſs motion than thoſe of the organs of feeling; as fruits and all acid liquors. Or they are ſuch as were ſuppoſed, by a particular viſcidity or groſſneſs of parts, to give the animal fluids a greater conſiſtency than they had before, and conſequently retard their motion, having leſs of that inteſtine force on which their heat depends: this property was aſcribed to cucumbers and ſimilar ſubſtances.

COOM, a term applied to the ſoot that gathers over an oven's mouth; and alſo to the black, greaſy ſubſtance, which works out of the wheels of carriages.

COOMB, or Comb, *of corn*, a dry meaſure containing four buſhels, or half a quarter.

COOP, in *Huſbandry*, a tumbrel or cart encloſed with boards, and uſed to carry dung, grains, &c.

Coop, is alſo the name of a pen, or encloſed place, where lambs, poultry, &c. are ſhut up in order to be fed.

COOPER, an artificer who makes caſks, coops tubs and barrels, and all kinds of wooden veſſels which are bound together with hoops. It would appear, that the art of the cooper is of great antiquity, and ſoon attained all the perfection which it at preſent poſſeſſes.

But although this art is very ancient, there are ſome countries in which it is yet unknown; and in other countries from the ſcarcity of wood, or from ſome other cauſes, earthen veſſels and ſkins lined with pitch are uſed for containing liquors. The Latin word *dolium*, is uſually tranſlated "caſk"; but it was employed by the Romans to denote earthen veſſels uſed for the ſame purpoſes. The word *dolare*, to "plane, or ſmooth," from which dolium is derived, and the word *dolarius*, a "cooper," may be naturally enough applied, the former to the conſtruction of caſks, which are made of ſeveral pieces of the ſame tree planed and fitted for joining together, and the latter to the artificer himſelf.

Pliny aſcribes the invention of caſks to the people who lived at the foot of the Alps. In his time they lined them with pitch. From the year 70 of the Chriſtian era in the time of Tiberius and Veſpaſian the art of conſtructing veſſels of different pieces of wood ſeems to have been well known. Indeed, previous to this period, Varro and Columella, in detailing the precepts of rural economy, ſpeak diſtinctly of veſſels formed of different pieces, and bound together with circles of wood or hoops. The deſcription which they have given accords exactly with the conſtruction of caſks. The fabrication of caſks, on account of the great abundance of wood, was probably very early introduced into France. When this art was firſt practiſed in Britain is unknown; but it ſeems not improbable that it was derived from the French.

The figure of a caſk is that of two truncated cones, or rather conoids, joined together; for the lines are not ſtraight, as in the cone, but are curved from the vertex to the baſe. As the place where the junction ſeems to take place is the moſt capacious, it is commonly called the belly of the caſk. In the choice of wood, old, thick, and ſtraight trees are preferred, from which thin planks are hewn which are to be formed into ſtaves. In France, the wood is prepared in winter; the ſtaves and bottoms are then formed, and they are put together, or, in the language of the artificer, the caſk is mounted, in ſummer. Planing the ſtaves is one of the moſt difficult parts of the work; and it is at the ſame time one of the moſt important in the fabrication of caſks. In dreſſing ſtaves with the plane, the workman is directed to cut acroſs the wood; the reaſon of which is probably to prevent the inſtrument following the courſe of the fibres, which may not always be in the ſame plane with the ſurface of the ſtave, and thus render it of unequal thickneſs.

In the formation of the ſtaves, it ought to be recollected, that each is to conſtitute part of a double conoid. It muſt therefore be broader at the middle, and muſt gradually become narrower, but not in ſtraight lines, towards the extremities. The outſide of the ſtaves, acroſs the wood, muſt be wrought into the ſegment of a circle; and it muſt be thickeſt near the middle, growing gradually thinner towards the ends. Great experience, it is obvious, muſt be requiſite for the nice adjuſtment of the different curves to the ſize and ſhape of the caſk. Leſs attention, as it is leſs neceſſary, is paid to the rounding or dreſſing of the inſide of the ſtave.

After the ſtaves are dreſſed and ready to be arranged in a circular form, it might be ſuppoſed neceſſary for the purpoſe of making the ſeams tight, to trim the thin edges in ſuch a manner, that the contiguous ſtaves may be brought into firm contact throughout the whole joint, or ſloped ſimilar to the arch-ſtones of a bridge. But this is not the practice which is uſually followed by the artificer. Without attempting to ſlope them, ſo that the whole ſurface of the edge may touch in every point, he brings the contiguous ſtaves into contact only at the inner ſurface; and in this way, by driving the hoops hard, he can make a cloſer joint than could be done by ſloping them from the outer to the inner ſide. In this, perhaps, with giving the proper curvature to the ſtaves, conſiſts the principal part of the cooper's art.

COOPER, *Anthony-Aſhley*, firſt earl of Shafteſbury, a moſt able ſtateſmen, was the ſon of Sir John Cooper, Bart. of Rockburn in Hampſhire, and was born in 1621. He was elected member for Tewkeſbury, at 19 years of age, in the ſhort parliament that met April 13. 1640. He ſeems to have been well affected to the king's ſervice at the beginning of the civil wars; for he repaired to the king at Oxford with offers of aſſiſtance: but Prince Maurice breaking articles to a town in Dorſetſhire that he had got to receive him, furniſhed him with a pretence for going over to the parliament, from which he accepted a commiſſion. When Richard Cromwell was depoſed, and the Rump came again into power, they nominated Sir Anthony one of their council of ſtate, and a commiſſioner for managing the army. At that very time he had engaged in a ſecret correſpondence for reſtoring Charles II. and, upon the king's coming over, was ſworn of his privy council. He was one of the commiſſioners for the trial of the regicides; was ſoon after made chancellor of the exchequer, then a commiſſioner of the treaſury; in 1672 was created earl of Shafteſbury; and ſoon after was raiſed to the poſt of lord chancellor. He filled this office with great ability and integrity; and though the ſhort time he was at the helm was in a tempeſtuous ſeaſon, it is doing him juſtice to ſay, nothing could either diſtract or affright him. The great ſeal was taken from him in 1673, 12 months after his receiving it; but, though out of office, he ſtill made a diſtinguiſhed figure in parliament, for it was not in his nature to remain inactive. He drew upon himſelf the implacable hatred of the duke of York, by ſteadily promoting, if not originally inventing, the famous project of an excluſion-bill. When his enemies came into power, he found it neceſſary to conſult his ſafety, by retiring into Holland, where he died ſix weeks after his arrival, in 1683. While his great abilities are confeſſed by all, it has been his miſfortune to have his hiſtory recorded by his enemies, who ſtudied to render him odious. Butler has given a very ſevere character of him in his Hudibras.

COOPER, *Anthony Aſhley*, earl of Shafteſbury, was ſon of Anthony earl of Shafteſbury, and grandſon of

Anthony firſt earl of Shafteſbury, lord high chancellor of England. He was born in 1671, at Exeter-houſe in London, where his grandfather lived, who from the time of his birth conceived ſo great an affection for him, that he undertook the care of his education; and he made ſo good a progreſs in learning, that he could read with eaſe both the Latin and Greek languages when only 11 years old. In 1683, his father carried him to the ſchool at Wincheſter, where he was often inſulted on his grandfather's account, whoſe memory was odious to the zealots for deſpotic power: he therefore prevailed with his father to conſent to his deſire of going abroad. After three years ſtay abroad, he returned to England in 1689, and was offered a ſeat in parliament in ſome of thoſe boroughs where his family had an intereſt. But this offer he did not now accept, that he might not be interrupted in the courſe of his ſtudies, which he proſecuted five years more with great vigour and ſucceſs; till, on Sir John Trenchard's death, he was elected burgeſs for Pool. Soon after his coming into parliament, he had an opportunity given him of expreſſing that ſpirit of liberty by which he uniformly directed his conduct on all occaſions. It was the bringing in and promoting "the act for regulating trials in caſes of high treaſon." But the fatigues of attending the houſe of commons in a few years ſo impaired his health, that he was obliged to decline coming again into parliament after the diſſolution in 1698. He then went to Holland, where the converſation of Mr Bayle, M. le Clerc, and ſeveral other learned and ingenious men, induced him to reſide a twelvemonth. During this time, there was printed at London, in 8vo. an imperfect edition of Lord Aſhley's Inquiry concerning Virtue. It had been ſurreptitiouſly taken from a rough draught, ſketched when he was no more than 20 years of age. His lordſhip, who was greatly chagrined at this event, immediately bought up the impreſſion before many books were ſold, and ſet about completing the treatiſe, as it afterwards appeared in the ſecond volume of the Characteriſtics. Soon after Lord Aſhley's return to England, he became, by the deceaſe of his father, earl of Shafteſbury. But his own private affairs hindered him from attending the houſe of lords till the ſecond year of his peerage, when he was very earneſt to ſupport King William's meaſures, who was at that time projecting the grand alliance. So much was he in favour with King William, that he had the offer of ſecretary of ſtate; but his declining conſtitution would not allow him to accept of it. Though he was diſabled from engaging in buſineſs, the king conſulted him on matters of very high importance; and it is pretty well known that he had the greateſt ſhare in compoſing that celebrated laſt ſpeech of King William, December 31. 1701. On Queen Anne's acceſſion to the throne, he returned to his retired manner of life, being no longer adviſed with concerning the public; and was then removed from the vice-admiralty of Dorſet, which had been in the family for three generations. In 1703, he made a ſecond journey to Holland, and returned to England the year following. The French prophets, ſoon after this, having by their enthuſiaſtic extravagancies made a great noiſe throughout the nation, and, among different opinions, ſome adviſing a proſecution, the lord Shafteſbury apprehended that ſuch meaſures tended rather to inflame than to cure the diſeaſe. This was the origin of his Letter concerning Enthuſiaſm, which he ſent to Lord Somers, then preſident of the council; and which being approved of by that nobleman and other gentlemen to whom it was ſhown, was publiſhed in 1708, though without the name of the author, or that of the perſon to whom it was addreſſed. His Moraliſt, a philoſophical Rhapſody, being a recital of certain converſations on natural and moral ſubjects, appeared in January 1709; and in the May following his *Senſus Communis*, an eſſay upon the freedom of Wit and Humour, in a Letter to a Friend. It was in the ſame year that he entered into the marriage ſtate with Mrs Jane Ewer, the youngeſt daughter of Thomas Ewer, Eſq. of Lee in Hertfordſhire. By this lady, to whom his lordſhip was related, he had an only ſon, Anthony the late earl of Shafteſbury. In 1710, his Soliloquy, or Advice to an Author, was publiſhed at London in 8vo. While he was thus employing himſelf in literary compoſition, his health declined ſo faſt, that it was recommended to him to ſeek aſſiſtance from a warmer climate. Accordingly, in July 1711, he ſet out for Naples, and purſuing his journey by way of France, was obliged to paſs through the duke of Berwick's army, which at that time lay encamped near the borders of Piedmont. Here he was entertained by that famous general in the moſt friendly manner, and every aſſiſtance was given him to conduct him in ſafety to the duke of Savoy's dominions. Our noble author's removal to Italy was of no ſervice to the re-eſtabliſhment of his health; for after having reſided at Naples about a year and a half, he departed this life on the 4th of February, O. S. 1712-13, in the 42d year of his age. The only pieces which he finiſhed after he came to this city, were the Judgment of Hercules, and the Letter concerning Deſign, which laſt was added to that impreſſion of the Characteriſtics which appeared in 1732. It was in 1711 that the firſt edition was publiſhed of all the Characteriſtics together, and in the order in which they now ſtand. But this publication not being entirely to his lordſhip's ſatisfaction, he chiefly employed the latter part of his life in preparing his writings for a more elegant edition; which was given to the world in 1713, ſoon after his deceaſe. The ſeveral prints that were then firſt interſperſed through the volumes were all invented by himſelf, and deſigned under his immediate inſpection; and for this purpoſe he was at the pains of drawing up a moſt accurate ſet of inſtructions, the manuſcript of which is ſtill preſerved in the family. That no miſtakes might be committed, the earl did not leave to any other hands ſo much as the drudgery of correcting the preſs. In the three volumes of the Characteriſtics of Men, Manners, Opinions, and Times, he completed the whole of his works which he intended for the public eye. Not long before his death he had formed a ſcheme of writing a diſcourſe on painting, ſculpture, and the other arts of deſign, which, if he had lived to have finiſhed it, might have proved a very pleaſing and uſeful work, as he had a fine taſte in ſubjects of that kind: but his premature deceaſe prevented his making any great progreſs in the undertaking. The earl of Shafteſbury had an eſteem for the works of the beſt Engliſh divines; one remarkable inſtance of which was diſplayed in his writing a Preface to a volume of Dr

Whichcot's Sermons, publiſhed in 1698. Copies of theſe ſermons had been taken in ſhort-hand, as they were delivered from the pulpit; and the earl had ſo high an opinion of them, that he not only introduced them to the world by his preface, but had them printed under his own particular inſpection. In his Letters to a Young Man at the univerſity, he ſpeaks of Biſhop Burnet and Dr Hoadly in terms of great applauſe, and has done juſtice to the merits of Tillotſon, Barrow, Chillingworth, and Hammond, as the chief pillars of the church againſt fanaticiſm. But whatever regard his lordſhip might have for ſome of our divines, it was to the writings of antiquity that his admiration was principally directed. Theſe were the conſtant objects of his ſtudy, and from them he formed his ſyſtem of philoſophy, which was of the civil, ſocial, and theiſtic kind.

Of Lord Shafteſbury's character, as a writer, different accounts have been given. As one of his greateſt admirers, may be mentioned Lord Monboddo; who, ſpeaking of his Rhapſodiſt in particular, does not heſitate to pronounce it not only the beſt dialogue in Engliſh, out of all degree of compariſon, but the ſublimeſt philoſophy; and, if we will join with it the Inquiry, the completeſt ſyſtem both of morality and theology, that we have in our language, and, at the ſame time, of the greateſt beauty and elegance for the ſtyle and compoſition.

Even ſeveral of the authors who have diſtinguiſhed themſelves by their direct oppoſition to many of the ſentiments which occur in the Characteriſtics, have nevertheleſs mixed no ſmall degree of applauſe with their cenſures. "I have again peruſed, with freſh pleaſure and freſh concern (ſays Mr Balguy, in his Letter to a Deiſt), the volumes of Characteriſtics—I heartily wiſh the noble author had been as unprejudiced in writing as I was in reading. If he had, I am perſuaded his readers would have found double pleaſure and double inſtruction. It ſeems to me, that his lordſhip had little or no temptation to purſue any ſingularities of opinion by way of diſtinction. His fine genius would ſufficiently have diſtinguiſhed him from vulgar authors in the high road of truth and ſenſe; on which account his deviations ſeem the more to be lamented. The purity and politeneſs of his ſtyle, and the delicacy of his ſentiments, are and muſt be acknowledged by all readers of taſte and ſincerity. But nevertheleſs, as his beauties are not eaſy to be overlooked, ſo neither are his blemiſhes. His works appear to be ſtained with ſo many groſs errors, and his fine thoughts are ſo often mingled with abſurdities, that however we may be charmed with the one, we are forced to condemn the other." Mr Balguy hath farther obſerved, with regard to the Inquiry concerning Virtue, which is the immediate object of his animadverſion, that though he cannot agree in every particular contained in it, he finds little more to do than to tell how much he admires; and that he thinks it indeed, in the main, a performance ſo juſt and exact as to deſerve higher praiſes than he is able to give it.

Dr Brown, in his eſſay on the Characteriſtics, obſerves that the earl of Shafteſbury hath in that performance mingled beauties and blots, faults and excellencies, with a liberal and unſparing hand. At the ſame time, the doctor applauds that generous ſpirit of freedom which ſhines throughout the whole. Another direct antagoniſt of the earl of Shafteſbury, Dr Leland, has obſerved, that no impartial man will deny him the praiſe of a fine genius. "The quality of the writer (continues the doctor), his lively and beautiful imagination, the delicacy of taſte he hath ſhown in many inſtances, and the graces and embelliſhments of his ſtyle, though perhaps ſometimes too affected, have procured him many admirers. To which may be added his refined ſentiments on the beauty and excellency of virtue, and that he hath often ſpoken honourably of a juſt and good Providence, which miniſters and governs the whole in the beſt manner; and hath ſtrongly aſſerted, in oppoſition to Mr Hobbes, the natural difference between good and evil; and that man was originally formed for ſociety, and the exerciſe of mutual kindneſs and benevolence; and not only ſo, but for religion and piety too. Theſe things have very much prejudiced many perſons in his favour, and prepared them for receiving, almoſt implicitly, whatever he hath advanced." Dr Johnſon, as we are informed by Sir John Hawkins, bore no good-will to Lord Shafteſbury; neither did he ſeem at all to reliſh the cant of the Shafteſburian ſchool, nor inclined to admit the pretenſions of thoſe who profeſſed it, to taſtes and perceptions which are not common to all men; a taſte in morals, in poetry and proſe writing, in painting, in ſculpture, in muſic, in architecture, and in government! A taſte that cenſured every production, and induced them to reprobate every effort of genius, that fell ſhort of their own capricious ſtandard.

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The grand point in which our noble author has rendered himſelf juſtly obnoxious to the friends of religion, is his having interſperſed through the Characteriſtics a number of inſinuations that appear to be unfavourable to the cauſe of revelation. There have not however been wanting many among his admirers, who have thought that he ought not to be reckoned among the deiſtical writers. The author of animadverſions upon Dr Brown's three Eſſays on the Characteriſtics, obſerves, that it is "imprudent, to ſay no worſe, in ſome ſincere advocates for Chriſtianity, to reject the friendly advice and aſſiſtance of ſo maſterly a writer as the lord Shafteſbury, and to give him up to the Deiſts as a patron of infidelity." But it is matter of fact, and not conſiderations of prudence or imprudence, that muſt determine the queſtion. In ſupport of his lordſhip's having been a believer in our holy religion, may be alleged, his Preface to Whichcot's Sermons, and his Letters to a Student at the univerſity: in both which works he conſtantly expreſſes himſelf in ſuch language as ſeems to indicate that he was really a Chriſtian. And with regard to the letters, it may be remarked, that they were written in 1707, 1708, and 1709, not many years before his lordſhip's death. Nevertheleſs, there are in the Characteriſtics ſo many ſceptical paſſages, that he muſt be conſidered as having been a doubter at leaſt, if not an abſolute diſbeliever, with reſpect to revelation. But if he muſt be ranked among the Deiſts, we agree with the obſervation of one of his biographers, that he is a very different Deiſt from numbers who have appeared in that character; his general principles being much leſs exceptionable.

The ſtyle of Lord Shafteſbury's compoſitions is alſo a point upon which various and contradictory ſentiments have been entertained. But for the fulleſt and moſt judicious criticiſm that has appeared upon that ſubject, we may refer the reader to Dr Blair's Lectures on Rhetoric and Belles Lettres, vol. i. p. 192, 193, 207, 208, 234, 263, and 396—398.

Cooper, *Samuel*, a very eminent Engliſh miniature painter, born in 1609, and bred under the care of his uncle John Hoſkins. He derived, however, his principal excellence from the ſtudy of the works of Vandyck, in whoſe time he lived; inſomuch that he was commonly ſtyled "Vandyck in little." His pencil was chiefly confined to the head, in which, with all its dependencies, eſpecially the hair, he was inimitable; but if he deſcended lower his incorrectneſs was notorious. He died in 1672; and his pieces are univerſally admired all over Europe, ſelling for incredible prices.—He had a brother, Alexander, likewiſe a good miniature painter, who became limner to Chriſtina queen of Sweden.

Cooper, *Thomas*, a pious and learned prelate in the reign of Queen Elizabeth, was born at Oxford about the year 1517. He was educated in the ſchool adjoining to Magdalene college, of which he was a choriſter, where alſo, in 1539, he was elected probationer, and fellow in the following year. About the year 1546, quitting his fellowſhip, he applied himſelf to the ſtudy of phyſic, in 1556 took the degree of bachelor in that faculty, and practiſed as phyſician at Oxford. Being inclined to the Proteſtant religion, probably this was only a prudent ſuſpenſion of his final intentions during the popiſh reign of Queen Mary; for, on the acceſſion of Elizabeth, he reſumed the ſtudy of divinity, became a celebrated preacher, was made dean of Chriſt-church, and vice-chancellor of the univerſity, having accumulated the degrees of bachelor and doctor in divinity. In 1569 he was made dean of Glouceſter; and, the year following, biſhop of Lincoln: whence, in 1584, he was tranſlated to the ſee of Wincheſter, in which city he died on the 29th of April 1594, and was buried in the cathedral there, on the ſouth ſide of the choir. The ſeveral writers who have mentioned Dr Cooper, unanimouſly give him the character of an eloquent preacher, a learned divine, and a good man. He had the misfortune, while at Oxford, to marry a lady whoſe gallantries became notorious: nevertheleſs he would not be divorced from her; knowing that he could not live without a wife, he did not chooſe "to charge his conſcience with the ſcandal of a ſecond marriage."—He wrote, 1. The Epitome of Chronicles from the 17th year after Chriſt to 1540, and thence after to 1560. 2. *Theſaurus linguæ Romanæ et Britannicæ*. This dictionary, which is an improvement upon Elyot's, was much admired by Queen Elizabeth, who thenceforward determined to promote the author. 3. A brief expoſition of ſuch chapters of the Old Teſtament as uſually are read in the church, at common prayer, on Sundays throughout the year. 4. An admonition to the people of England. 5. Sermons.

Cooper, *John Gilbert*, a polite writer of the preſent age, was born in 1723; and was deſcended from an ancient family in the county of Nottingham, whoſe fortune was injured in the laſt century by their attachment to the principles of monarchy. He reſided at Thurgarton priory in Nottinghamſhire, which was granted by King Henry VIII. to William Cooper, one of his anceſtors. This manſion Mr Cooper inherited from his father, who in 1739 was high ſheriff of the county; and tranſmitted it to his ſon, who filled the ſame reſpectable office in 1783. After paſſing through Weſtminſter ſchool under Dr John Nicoll, along with the late Lord Albemarle, Lord Buckinghamſhire, Major Johnſon, Mr George Aſhby, and many other eminent and ingenious men, he became in 1743 a fellow-commoner of Trinity-college, Cambridge, and reſided there two or three years; but quitted the univerſity on his marriage with Suſanna the daughter of William Wrighte, Eſq; ſon to the lord keeper of that name, and recorder of Leiceſter 1729—1763. In the year 1745 he commenced author by the publication of The Power of Harmony, a poem in 4to; and in 1746 and 1747 he produced ſeveral Eſſays and Poems under the ſignature of Philalethes, in a periodical work called *The Muſeum*, publiſhed by Mr Dodſley. In the ſame year he came forward as an author, with his name, by a work which received much aſſiſtance from his friend the Reverend John Jackſon of Leiceſter, who communicated ſeveral learned notes, in which he contrived to manifeſt his diſlike to his formidable antagoniſt Mr Warburton. It was entitled The Life of Socrates, collected from the Memorabilia of Xenophon, and the Dialogues of Plato, and illuſtrated farther by Ariſtotle, Diodorus Siculus, Cicero, Proclus, Apuleius, Maximus Tyrius, Boethius, Diogenes Laertius, Aulus Gellius, and others: 1749, 8vo. In this work Mr Cooper gave evident marks of ſuperior genius; warm, impetuous, and impatient of reſtraint. In 1754, Mr Cooper publiſhed his Letters on Taſte, 8vo; an elegant little volume, on which no ſmall ſhare of his reputation is founded; and in 1755, The Tomb of Shakeſpeare, a Viſion, 4to; a decent performance, but in which there is more of wit and application than of nature or genius. In 1756 he aſſiſted Mr Moore, by writing ſome numbers of the World; and attempted to rouſe the indignation of his countrymen againſt the Heſſians, at that juncture brought over to defend the nation, in a poem called the Genius of Britain, addreſſed to Mr Pitt. In 1758, he publiſhed Epiſtles to the Great, from Ariſtippus in Retirement, 4to; and The Call of Ariſtippus, Epiſtle IV. to Mark Akenſide, M. D. Alſo, A Father's Advice to his ſon, in 4to. In the Annual Regiſter of the ſame year is his Tranſlation of an Epiſtle from the King of Pruſſia to Monſieur Voltaire. In 1759, he publiſhed Ver Vert; or the Nunnery Parrot; an Heroic Poem, in four cantos, inſcribed to the Abbeſs of D***; tranſlated from the French of Monſieur Greſſet, 4to; reprinted in the firſt volume of Dilly's Repoſitory, 1777; and, in 1764, Poems on ſeveral ſubjects, by the Author of the Life of Socrates; with a prefatory Advertiſement by Mr Dodſley. In this little volume were included all the ſeparate poetical pieces which have been already mentioned, excepting Ver Vert, which is a ſprightly compoſition. Mr Cooper died at his father's houſe in May Fair, after a long and excruciating illneſs ariſing from the ſtone, April 14th 1769.

CO ORDINATE, ſomething of equal order, rank, or degree with another.

COOT. See Fulica, Ornithology *Index*.

COPAIBA, or *Balſam of* Copaiba, a liquid refinous juice, flowing from inciſions made in the trunk of the copaifera balſamum. See MATERIA MEDICA *Index*.

COPAIFERA, in *Botany*, a genus belonging to the decandria claſs of plants. See BOTANY *Index*.

COPAL, improperly called *gum copal*, is a gum of the reſinous kind brought from New Spain, being the concrete juice of the *Rhus Copallinum*. It is employed as a varniſh. See VARNISHING and CHEMISTRY *Index*.

COPARCENARY, the ſhare or quota of a coparcener.

COPARCENERS, (from *con* and *particeps*, "partner;"), or PARCENERS; ſuch as have equal portions in the inheritance of their anceſtor.

Coparceners are ſo either by law or cuſtom. Coparceners by law, are the iſſue female; which, in default of a male or heir, come equally to the lands of their anceſtors. Coparceners by cuſtom, are thoſe who, by ſome peculiar cuſtom of the country, challenge equal parts in ſuch lands; as in Kent, by the cuſtom of gavelkind. The crown of England is not ſubject to coparcenary.

COPE, an eccleſiaſtical ornament, uſually worn by chanters and ſubchanters, when they officiate in ſolemnity. It reaches from the ſhoulders to the feet. The ancients called it *Pluviale*.—The word is alſo uſed for the roof or covering of a houſe, &c.

COPE is alſo the name of an ancient cuſtom or tribute due to the king or lord of the ſoil, out of the lead-mines in ſome part of Derbyſhire; of which Manlove ſaith thus:

Egreſs and regreſs to the king's highway,
The miners have; and *lot* and *cope* they pay;
The thirteenth diſh of ore within their mine,
To the lord for *lot*, they pay at meaſuring time;
Sixpence a load for *cope* the lord demands,
And that is paid to the *burghmaſter's* hands.

This word by doomſday-book, as Mr Hagar hath interpreted it, ſignifies a hill: and *cope* is taken for the ſupreme cover, as the *cope of heaven*.

COPEL. See CUPEL.

COPENHAGEN, the capital of the kingdom of Denmark, ſituated on the eaſtern ſhore of the iſland of Zealand, upon a fine bay of the Baltic ſea, not far from the ſtrait called the Sound. E. Long. 13. 0. N. Lat. 55. 30.

The preciſe date of the foundation of this city is diſputed; but the moſt probable account is, that it took its riſe from a caſtle built on the ſpot in the year 1168, as a protection againſt the pirates which at that time ſwarmed in the Baltic. The conveniency of the ſituation, and the ſecurity afforded by the caſtle, ſoon induced a number of the inhabitants of Zealand to reſort thither: but it was not diſtinguiſhed by the royal reſidence until 1443, during the reign of Chriſtopher of Bavaria; ſince which period it has been gradually enlarged and beautified, and is become the capital of Denmark.

Copenhagen is the beſt built city of the north; for although Peterſburgh excels it in ſuperb edifices, yet, as it contains no wooden houſes, it does not diſplay that ſtriking contraſt of meanneſs and magnificence; but in general exhibits a more equable and uniform appearance. The town is ſurrounded towards the land with regular ramparts and baſtions, a broad ditch full of water, and a few outworks, its circumference meaſures between four and five miles. The ſtreets are well paved, with a foot-way on each ſide, but too narrow and inconvenient for general uſe. The greateſt part of the buildings are of brick; and a few are of free-ſtone brought from Germany. The houſes of the nobility are in general ſplendid, and conſtructed in the Italian ſtyle of architecture: the palace, which was erected by Chriſtian VI. is a large pile of building; the front is of ſtone, and the wings of brick ſtuccoed; the ſuite of apartments is princely; but the external appearance is more grand than elegant.

The buſy ſpirit of commerce is viſible in this city, which contains about 80,000 inhabitants. The haven is always crowded with merchant ſhips: and the ſtreets are interſected by broad canals, which bring the merchandiſe cloſe to the warehouſes that line the quays. This city owes its principal beauty to a dreadful fire in 1728, that deſtroyed five churches and 67 ſtreets, which have been ſince rebuilt in the modern ſtyle. The new part of the town, raiſed by the late king Frederic V. is extremely beautiful, ſcarcely inferior to Bath. It conſiſts of an octagon, containing four uniform and elegant buildings of hewn ſtone, and of four broad ſtreets leading to it in oppoſite directions. In the middle of the area ſtands an equeſtrian ſtatue of Frederic V. in bronze, as big as life, which coſt 80,000l. The Royal Muſeum, or Cabinet of Rarities, merits the attention of travellers. This collection, which was begun by Frederic III. is depoſited in eight apartments, and ranged in the following order: animals, ſhells, minerals, paintings, antiquities, medals, dreſſes, arms and implements of the Laplanders.

Part of Copenhagen, which is called *Chriſtianſhafen*, is built upon the iſle of Amak, which generally attracts the curioſity of foreigners; (ſee AMAK). From this place, to which the main city is joined by a bridge, the markets are ſupplied with fowl, beef, mutton, veniſon, corn, and culinary vegetables, which are produced here in the greateſt abundance.

COPERNICAN, in general, ſomething belonging to COPERNICUS. Hence

COPERNICAN Syſtem or *Hypotheſis*, that ſyſtem of the world wherein the ſun is ſuppoſed to reſt in the centre, and the planets, with the earth, to move in ellipſes round him. See COPERNICUS.

COPERNICUS, NICOLAUS, an eminent aſtronomer, was born at Thorn in Pruſſia, Jan. 10. 1472. He was taught the Latin and Greek languages at home; and afterwards ſent to Cracovia, where he ſtudied philoſophy and phyſic. His genius in the mean time was naturally turned to mathematics, which he purſued through all its various branches. He ſet out for Italy when he was 23 years of age; but ſtaid at Bononia ſome time, for the ſake of being with the celebrated aſtronomer of that place, Dominicus Maria: whoſe converſation, however, and company, he affected, not ſo much as a learner, as an aſſiſtant to him in making his obſervations. From thence he paſſed to Rome, where he was no ſooner arrived than he was conſidered as not inferior to the famous Regiomontanus; and acquired, in ſhort, ſo great a reputation, that he was choſen profeſſor of mathematics, which he taught for a long time with great applauſe. He alſo made ſome aſtronomical obſervations there about the year 1500. Returning to his own country ſome years after, he began to apply his vaſt knowledge in mathematics to correct the ſyſtem of aſtronomy which then prevailed. He ſet himſelf to collect all the books which had been written by philoſophers and aſtronomers, and to examine all the various hypotheſes they had invented for the ſolution of the celeſtial phenomena, to try if a more ſymmetrical order and conſtitution of the parts of the world could not be diſcovered, and a more juſt and exquiſite harmony in its motions eſtabliſhed, than what the aſtronomers of thoſe times ſo eaſily admitted. But of all their hypotheſes none pleaſed him ſo well as the Pythagorean, which made the ſun to be the centre of the ſyſtem, and ſuppoſed the earth to move not only round the ſun, but round its own axis alſo. He thought he diſcerned much beautiful order and proportion in this; and that all that embarraſſment and perplexity from epicycles and excentrics, which attended the Ptolemaic hypotheſis, would here be entirely removed.

This ſyſtem, then, he began to conſider, and to write upon, when he was about 35 years of age. He employed himſelf in contemplating the phenomena carefully; in making mathematical calculations; in examining the obſervations of the ancients, and in making new ones of his own; and after more than 20 years chiefly ſpent in this manner, he brought his ſcheme to perfection, and eſtabliſhed that ſyſtem of the world which goes by his name, and is now univerſally received, (ſee ASTRONOMY *Index*). His ſyſtem, however, was then looked upon as a moſt dangerous hereſy; for which he was thrown into priſon by Pope Urban VIII. and not ſuffered to come out till he had recanted his opinion; that is, till he had renounced the teſtimony of his ſenſes. He died the 24th of May 1543, in the 70th year of his age.

This extraordinary man had been made canon of Worms by his mother's brother, Lucas Wazelrodius, who was biſhop of that place. He was not only the greateſt of aſtronomers, but a perfect maſter of the Greek and Latin tongues; to all which he joined the greateſt piety and innocence of manners.

The following is the account of the diſcoveries of Copernicus by Dr Smith, in his *Eſſays on Philoſophical Subjects*.

“ The confuſion (ſays Dr Smith) in which the old hypotheſis repreſented the heavenly bodies, was, as Corpernicus himſelf tells us, what firſt ſuggeſted to him the deſign of forming a new ſyſtem, that theſe, the nobleſt works of nature, might no longer appear devoid of that harmony and proportion which diſcover themſelves in her meaneſt productions. What moſt of all diſſatisfied him was, the notion of the equalizing circle, which, by repreſenting the revolutions of the celeſtial ſpheres as equable only when ſurveyed from a point that was different from their centres, introduced a real inequality into their motions; contrary to that moſt natural, and indeed fundamental idea, with which all the authors of aſtronomical ſyſtems, Plato, Eudoxus, Ariſtotle, even Hipparchus and Ptolemy themſelves, had hitherto ſet out, that the real motions of ſuch beautiful and divine objects muſt neceſſarily be perfectly regular, and go on in a manner as agreeable to the imagination as the objects themſelves are to the ſenſes. He began to conſider, therefore, whether, by ſuppoſing the heavenly bodies to be arranged in a different order from that in which Ariſtotle and Hipparchus had placed them, this ſo much ſought for uniformity might not be beſtowed upon their motions. To diſcover this arrangement he examined all the obſcure traditions delivered down to us, concerning every other hypotheſis which the ancients had invented for the ſame purpoſe. He found, in Plutarch, that ſome Pythagoreans had repreſented the earth as revolving in the centre of the univerſe, like a wheel round its own axis; and that others, of the ſame ſect had removed it from the centre, and repreſented it as revolving in the ecliptic like a ſtar round the central fire. By this central fire he ſuppoſed they meant the ſun; and though in this he was very widely miſtaken, it was, it ſeems, upon this interpretation that he began to conſider how ſuch an hypotheſis might be made to correſpond to the appearances. The ſuppoſed authority of thoſe old philoſophers, if it did not originally ſuggeſt to him his ſyſtem, ſeems at leaſt to have confirmed him in an opinion which, it is not improbable, he had beforehand other reaſons for embracing, notwithſtanding what he himſelf would affirm to the contrary.

“ It then occurred to him, that if the earth was ſuppoſed to revolve every day round its axis, from weſt to eaſt, all the heavenly bodies would appear to revolve, in a contrary direction, from eaſt to weſt. The diurnal revolution of the heavens, upon this hypotheſis, might be only apparent; the firmament, which has no other ſenſible motion, might be perfectly at reſt; while the ſun, the moon, and the five planets, might have no other movement beſide that eaſtward revolution which is peculiar to themſelves. That, by ſuppoſing the earth to revolve with the planets round the ſun, in an orbit, which comprehended within it the orbits of Venus and Mercury, but was comprehended within thoſe of Mars, Jupiter, and Saturn, he could, without the embarraſſment of epicycles, connect together the apparent annual revolutions of the ſun, and the direct, retrograde, and ſtationary appearances of the planets; that while the earth really revolved round the ſun on one ſide of the heavens, the ſun would appear to revolve round the earth on the other; that while ſhe really advanced in her annual courſe, he would appear to advance eaſtward in that movement which is peculiar to himſelf. That, by ſuppoſing the axis of the earth to be always parallel to itſelf, not to be quite perpendicular, but ſomewhat inclined to the plane of her orbit, and conſequently to preſent to the ſun the one pole when on the one ſide of him, and the other when on the other, he would account for the obliquity of the ecliptic; the ſun's ſeemingly alternate progreſſion from north to ſouth, and from ſouth to north; the conſequent change of the ſeaſons, and different lengths of days and nights in the different ſeaſons.

“ If this new hypotheſis thus connected together all theſe appearances as happily as that of Ptolemy, there were others which it connected together much better. The three ſuperior planets, when nearly in conjunction with the ſun, appear always at the greateſt diſtance from the earth; are ſmalleſt, and leaſt ſenſible to the eye; and ſeem to revolve forward in their direct motion with the greateſt rapidity. On the contrary, when in oppoſition to the ſun, that is, when in their meridian about midnight, they appear neareſt the earth, are largeſt, and moſt ſenſible to the eye, and ſeem to revolve backwards in their retrograde motion. To explain theſe appearances, the ſyſtem of Ptolemy ſuppoſed each of theſe planets to be at the upper part of their ſeveral epicycles in the one caſe, and at the lower in the other. But it afforded no ſatisfactory principle of connection, which could lead the mind eaſily to conceive how the epicycles of thoſe planets, whoſe ſpheres were ſo diſtant from the ſphere of the ſun, ſhould thus, if one may ſay ſo, keep time to his motion. The ſyſtem of Copernicus afforded this eaſily; and like a more ſimple machine, without the aſſiſtance of epicycles, connected together, by fewer movements, the complex appearances of the heavens. When the ſuperior planets appear nearly in conjunction with the ſun, they are then in the ſide of their orbits, which is almoſt oppoſite to, and moſt diſtant from, the earth, and therefore appear ſmalleſt and leaſt ſenſible to the eye. But as they then revolve in a direction which is almoſt contrary to that of the earth, they appear to advance forward with double velocity; as a ſhip that ſails in a contrary direction to another, appears from that other to ſail both with its own velocity and the velocity of that from which it is ſeen. On the contrary, when thoſe planets are in oppoſition to the ſun, they are on the ſame ſide of the ſun with the earth, are neareſt it, moſt ſenſible to the eye, and revolve in the ſame direction with it; but as their revolutions round the ſun are ſlower than that of the earth, they are neceſſarily left behind by it, and therefore ſeem to revolve backwards; as a ſhip which ſails ſlower than another, though it ſails in the ſame direction, appears from that other to ſail backwards. After the ſame manner, by the ſame annual revolution of the earth, he connected together the direct and retrograde motions of the two inferior planets, as well as the ſtationary appearances of all the five.

“ Thus far did this new account of things render the appearances of the heavens more completely coherent than had been done by any of the former ſyſtems. It did this, too, by a more ſimple and intelligible, as well as more beautiful machinery. It repreſented the ſun, the great enlightener of the univerſe, whoſe body was alone larger than all the planets taken together, as eſtabliſhed immoveable in the centre, ſhedding light and heat on all the worlds that circulated around him in one uniform direction, but in longer or ſhorter periods according to their different diſtances. It took away the diurnal revolution of the firmament, whoſe rapidity, upon the old hypotheſis, was beyond what even thought could conceive. It not only delivered the imagination from the embarraſſment of epicycles, but from the difficulty of conceiving theſe two oppoſite motions going on at the ſame time, which the ſyſtem of Ptolemy and Ariſtotle beſtowed upon all the planets; I mean, their diurnal weſtward, and periodical eaſtward revolutions. The earth's revolution round its own axis took away the neceſſity for ſuppoſing the firſt, and the ſecond was eaſily conceived when by itſelf. The five planets, which ſeem, upon all other ſyſtems, to be objects of a ſpecies by themſelves, unlike to every thing to which the imagination has been accuſtomed, when ſuppoſed to revolve along with the earth round the ſun, were naturally apprehended to be objects of the ſame kind with the earth, habitable, opaque, and enlightened only by the rays of the ſun. And thus this hypotheſis, by claſſing them in the ſame ſpecies of things, with an object that is of all others the moſt familar to us, took off that wonder and uncertainty which the ſtrangeneſs and ſingularity of their appearance had excited; and thus far, too, better anſwered the great end of philoſophy.

“ Neither did the beauty and ſimplicity of this ſyſtem alone recommend it to the imagination; the novelty and unexpectedneſs of that view of nature which it opened to the fancy, excited more wonder and ſurpriſe than the ſtrangeſt of thoſe appearances, which it had been invented to render natural and familiar, and theſe ſentiments ſtill more endeared it. For though it is the end of philoſophy to allay that wonder which either the unuſual or ſeemingly disjointed appearances of nature excite, yet ſhe never triumphs ſo much as when, in order to connect together a few, in themſelves perhaps inconſiderable objects, ſhe has, if I may ſay ſo, created another conſtitution of things, more natural indeed, and ſuch as the imagination can more eaſily attend to, but more new, more contrary to common opinion and expectation, than any of thoſe appearances themſelves. As in the inſtance before us, in order to connect together ſome ſeeming irregularities in the motions of the planets, the moſt inconſiderable objects in the heavens, and of which the greater part of mankind have no occaſion to take any notice during the whole courſe of their lives, ſhe has, to talk in the hyperbolical language of Tycho Brahé, moved the earth from its foundations, ſtopt the revolution of the firmament, made the ſun ſtand ſtill, and ſubverted the whole order of the univerſe.

“ Such were the advantages of this new hypotheſis, as they appeared to its author when he firſt invented it. But though that love of paradox, ſo natural to the learned, and that pleaſure which they are ſo apt to take in exciting, by the novelty of their ſuppoſed diſcoveries, the amazement of mankind, may, notwithſtanding what one of his diſciples tells us to the contrary, have had its weight in prompting Copernicus to adopt this ſyſtem; yet when he had completed his Treatiſe of Revolutions, and began coolly to conſider what a ſtrange doctrine he was about to offer to the world, he ſo much dreaded the prejudice of mankind againſt it, that, by a ſpecies of continence of all others the moſt difficult to a philoſopher, he detained it in his cloſet for thirty years together. At laſt, in the extremity of old age, he allowed it to be extorted from him, but died as ſoon as it was printed, and before it was publiſhed.”

COPERNICUS, the name of an aſtronomical inſtrument, invented by Mr Whiſton, to exhibit the motion and phenomena of the planets, both primary and ſecondary. It is built upon the Copernican ſyſtem, and for that reaſon called by his name.

COPHTI, COPHTS, or COPTI, a name given to the Chriſtians of Egypt, who are of the ſect of Jacobites.

The critics are extremely divided about the origin and orthography of the word; ſome write it Cophti, others Cophtites, Cophtitæ, Copts, &c. Scaliger derives the name from Coptos, an anciently celebrated town of Egypt, the metropolis of the Thebaid. Kircher refutes this opinion, and maintains, that the word originally ſignifies “ cut” and “ circumſcribed;” and was given theſe people by the Mahometans, by way of reproach, becauſe of their practice of circumciſing: but P. Sollier, another Jeſuit, refutes this opinion. Scaliger afterwards changed his opinion, and derived the word from Αιγυπτος, the ancient name of Egypt, by retrenching the firſt ſyllable: but this opinion, too, P. Sollier diſputes. John de Leo and others ſay, that the Egyptians anciently called their country *Elchibth*, or *Cibth*, from Cibth their firſt king, whence Cophtite, &c. others ſay from Cobtim ſecond king of Egypt. Vandeb derives the word Copht from Copt, ſon of Miſraim, grandſon of Noah. All theſe etymologies P. Sollier rejects, on this principle, that were they true, the Egyptians ought all equally to be called *Cophti;* whereas, in effect, none but the Chriſtians, and among thoſe none but the Jacobites, bear the name, the Melchites not being comprehended under it. Hence he chooſes to derive the word from the name *Jacobite*, retrenching the firſt ſyllable; whence Cobite, Cobea, Copta, and Cophta.

The Cophts have a patriarch who reſides at Cairo, but he takes his title from Alexandria: he has no archbiſhop under him, but 11 or 12 biſhops. The reſt of the clergy, whether ſecular or regular, is compoſed of the orders of St Anthony, St Paul, and St Macarius, who have each their monaſteries. Beſides the orders of prieſts, deacons, and ſubdeacons, the Cophts have likewiſe archimandrites, the dignity whereof they confer with all the prayers and ceremonies of a ſtrict ordination. This makes a conſiderable difference among the prieſts; and beſides the rank and authority it gives them with regard to the religious, it comprehends the degree and functions of archprieſts. By a cuſtom of 600 years ſtanding, if a prieſt elected biſhop be not already archimandrite, that dignity muſt be conferred on him before epiſcopal ordination. The ſecond perſon among the clergy, after the patriarch, is the titular patriarch of Jeruſalem, who alſo reſides at Cairo, becauſe of the few Cophts at Jeruſalem; he is, in effect, little more than the biſhop of Cairo: only he goes to Jeruſalem every Eaſter, and viſits ſome other places in Paleſtine near Egypt, which own his juriſdiction. To him belongs the government of the Cophtic church, during the vacancy of the patriarchal ſee.

To be elected patriarch, it is neceſſary the perſon have lived all his life in continence: it is he confers the biſhoprics. To be elected biſhop, the perſon muſt be in the celibate; or, if he has been married, it muſt not be above once. The prieſts and inferior miniſters are allowed to be married before ordination; but are not obliged to it, as Ludolphus erroneouſly obſerves. They have a great number of deacons, and even confer the dignity frequently on children. None but the loweſt rank among the people commence eccleſiaſtics; whence ariſes that exceſſive ignorance found among them; yet the reſpect of the laity towards the clergy is very extraordinary. Their office is longer than the Roman office, and never changes in any thing: they have three liturgies, which they vary occaſionally.

The monaſtic life is in great eſteem among the Cophts: to be admitted into it, there is always required the conſent of the biſhop. The religious Cophts make a vow of perpetual chaſtity; renounce the world, and live with great auſterity in deſerts: they are obliged to ſleep in their clothes and their girdle, on a mat ſtretched on the ground; and to proſtrate themſelves every evening 150 times, with their face and breaſt on the ground. They are all both men and women, of the loweſt claſs of the people; and live on alms. The nunneries are properly hoſpitals; and few enter but widows reduced to beggary.

F. Roderic reduces the errors and opinions of the Cophts to the following heads: 1. That they put away their wives, and eſpouſe others while the firſt are living. 2. That they have ſeven ſacraments, viz. baptiſm, the euchariſt, confirmation, ordination, faith, faſting, and prayer. 3. That they deny the Holy Spirit to proceed from the Son. 4. That they only allow of three œcumenical councils; thoſe of Nice, Conſtantinople, and Epheſus. 5. That they only allow of one nature, will, and operation, in Jeſus Chriſt, after the union of the humanity with the divinity. For their errors in diſcipline, they may be reduced, 1. To the practice of circumciſing their children before baptiſm, which has obtained among them from the 12th century. 2. To their ordaining deacons at five years of age. 3. To their allowing of marriage in the ſecond degree. 4. To their forbearing to eat blood; to which ſome add their belief of a baptiſm by fire, which they confer by applying a hot iron to their forehead or cheeks. —Others palliate theſe errors, and ſhow that many of them are rather abuſes of particular perſons than doctrines of the ſect. This ſeems to be the caſe with regard to their polygamy, eating of blood, marrying in the ſecond degree, and the baptiſm of fire; for circumciſion, it is not practiſed as a ceremony of religion, nor as of any divine appointment, but merely as a cuſtom, which they derive from the Iſhmaelites; and which, perhaps, may have had its origin from a view to health and decency in thoſe hot countries.

The Cophts, at different times, have made ſeveral reunions with the Latins; but always in appearance only, and under ſome neceſſity of their affairs. In the time of Pope Paul IV. a Syrian was diſpatched to Rome from the patriarch of Alexandria, with letters to that pope; wherein he acknowledged his authority, and promiſed obedience; deſiring a perſon might be diſpatched to Alexandria; to treat about a reunion of his church to that of Rome; purſuant to which, Pius IV. ſucceſſor to Paul, choſe F. Roderic, a Jeſuit, whom he diſpatched in 1561, in quality of apoſtolical nuncio. But the Jeſuit, upon a conference with two Cophts deputed for that purpoſe by the patriarch, was made to know, that the titles of father of fathers, paſtor of paſtors, and maſter of all churches, which the patriarch had beſtowed on the pope in his letters, were no more than mere matters of civility and compliment; and that it was in this manner the patriarch uſed to write to his friends: they added, that ſince the council of Chalcedon, and the eſtabliſhment of ſeveral patriarchs independent of one another, each was chief and maſter of his own church. This was the anſwer the patriarch gave the pope, after he had received a ſum of money remitted to him from Rome, by the hands of the Venetian conſul.

COPHTIC, or COPTIC, the language of the Cophts, the ancient language of the Egyptians, mixed with a great deal of Greek, the characters it is written in being all Greek. It has a form and conſtruction peculiar to itſelf: it has no inflections of the nouns or verbs; but expreſſes number, caſe, gender, perſon, mood, tenſe, and poſſeſſive pronouns, by letters and particles prefixed.

F. Kircher is the firſt who publiſhed a grammar and vocabulary of the Cophtic. There is not known any book extant in the Cophtic, except tranſlations of the Holy Scriptures, or of eccleſiaſtical offices; or others that have relation thereto, as dictionaries, &c.

The ancient Cophtic is now no longer found but in books; the language now uſed throughout the country is Arabic. The old Cophtic, which Kircher maintains to be a mother-tongue, and independent of all others, had been much altered by the Greeks: for beſides that it has borrowed all its characters from the Greek, with a very little variation, a great number of the words are pure Greek. Voſſius, indeed, aſſerts, that there was no Cophtic language till after Egypt became ſubject to the Arabs. The language, according to him, is a mixture of Greek and Arabic: the very name thereof not being in the world till after the Arabs were maſters of the country. But this, M. Simon obſerves, proves nothing; except that what was anciently called *Egyptian*, has ſince by the Arabs been called *Cophtic*, by a corruption of ſpeech. There are, it is true, Arabic words in the Cophtic; yet this by no means proves but that there was a language before that time, either Cophtic or Egyptian. Pietro de la Valle obſerves, that the Cophts have entirely loſt their ancient tongue; that it is now no longer underſtood among them; that they have nothing extant therein but ſome ſacred books; and that they ſtill ſay maſs in it.

All their other books have been tranſlated into Arabic, which is their vulgar tongue; and this has occaſioned the originals to be loſt: it is added, that they rehearſe the epiſtles and goſpels in the maſs twice; once in Arabic and once in Cophtic. Indeed, if we believe F. Vanſleb, the Cophts ſay the maſs in Arabic, all but the epiſtles and goſpels, which they rehearſe both in that and Cophtic.

COPHTIC *Bible*. See BIBLE.

COPHTIC *Liturgies* are three; one attributed to Baſil, another to St Gregory, and the third to Cyril: they are tranſlated into Arabic for the uſe of the prieſts and people.

COPIATA, under the weſtern empire, a grave-digger. In the firſt ages of the church there were clerks deſtined for this employment. In the year 357 Conſtantine made a law in favour of the prieſts copiatæ, i. e. of thoſe who had the care of interments; whereby he exempts them from the luſtral contribution which all other traders paid. It was under him alſo that they firſt began to be called *copiatæ*, q. d. clerks deſtined for bodily labour, from κοπος, or κοπτω, *ſcindo*, *cedo*, *ferio*, "I cut, beat," &c. Before that time they were called *decani* and *lecticarii*; perhaps becauſe they were divided by decades or tens, each whereof had a bier or litter for the carriage of the dead bodies. Their place among the clerks was the next in order before the chantors.

COPING *of a wall*, the top or cover of a wall, made ſloping to carry off the water.

COPING *over*, in *Carpentry*, a ſort of hanging over, not ſquare to its upright, but bevelling on its under ſide till it end in an edge.

COPIST, in diplomatic ſcience, ſignifies a tranſcriber or copier of deeds, books, &c.

COPPA, in *Law*, a cop or cock of graſs, hay, or corn, divided into titheable portions; as the tenth cock, &c. This word in ſtrictneſs denotes the gathering or laying up the corn in cops or heaps, as the method is for barley or oats, &c. not bound up, that it may be the more fairly and juſtly tithed: and in Kent they ſtill retain the word, a *cop* or *cap* of hay, ſtraw, &c.

COPPEL. See CUPEL.

COPPER, one of the metals, called by the alchemiſts *Venus*, on account of its facility of uniting with a great number of different metallic ſubſtances. Its colour, when pure, is pale red, and its ſpecific gravity from 8.7 to 9.3, which depends not only on its degree of purity, but alſo on its condenſation by hammering. See CHEMISTRY *Index*.

COPPERAS, a name given to the factitious ſulphate of iron. See CHEMISTRY *Index*.

COPPERPLATE. See ENGRAVING.

COPPICE, or COPSE, a little wood, conſiſting of under-woods, or ſuch as may be raiſed either by ſowing or planting.

COPTOS, in *Ancient Geography*, a famous trading town of the Thebais, inhabited by Egyptians and Arabs, ſome diſtance from the Nile; others place it in a ſmall iſland in the Nile, on which, however, it had a port. Here Iſis, on hearing of the death of Oſiris, cut one of her locks, and put on mourning; and hence the name *Coptos*, ſignifying privation. A proof this of the antiquity of the place. And for this reaſon the Iſiaci, or prieſts of Iſis, were bald, according to Juvenal.

COPULATION, the act of generation, or the congreſs of the male and female, otherwiſe called *coition*. See GENERATION.

COPY, in a law ſenſe, a tranſcript of a writing or inſtrument, made for the uſe and ſatisfaction of ſome of the parties concerned, or in order to preſerve the memory thereof.

COPY is alſo uſed for an imitation of any original work; particularly a painting, draught, figure, &c.

COPY, among printers, denotes the manuſcript or original of a book given to print from.

COPY-Hold, a tenure for which a tenant has nothing to ſhow but the copy of the rolls made by the ſteward of the lord's court.

It is called a baſe tenure; becauſe the tenant holds the land at the will of the lord. However, it is not ſimply at the will of the lord, but according to the cuſtom of the manor by which ſuch eſtate is deſcendible, and the tenant's heirs may inherit it; and a copy-holder, ſo long as he does his ſervices, and does not break the cuſtom, cannot be ejected by the lord; and if he be, he ſhall have treſpaſs againſt him. See the articles TENURE and VILLENAGE.

COPY-Holder, one who is admitted tenant of lands or tenements within a manor, which time out of mind, by uſe and cuſtom of the manor, have been demiſable, and demiſed to ſuch as will take them in fee-ſimple, or fee-tail, for life, years, or at will, according to the cuſtom of the manor by copy of court-roll; but is generally where the tenant has ſuch eſtate either in fee or for three lives.

Copy-Right, the right which an author may be ſuppoſed to have in his own original literary compoſitions; ſo that no other perſon, without his leave, may publiſh or make profit of the copies. When a man by the exertion of his rational powers has produced an original work, he has clearly a right to diſpoſe of that identical work as he pleaſes; and any attempt to take it from him, or vary the diſpoſition he has made of it, is an invaſion of his right of property. Now the identity of a literary compoſition conſiſts entirely in the ſentiment and the language; the ſame conceptions, clothed in the ſame words, muſt neceſſarily be the ſame compoſition: and whatever method be taken of conveying that compoſition to the ear, or to the eye of another, by recital, by writing, or by printing, in any number of copies, or at any period of time, it is always the identical work of the author which is ſo conveyed; and no other man (it hath been thought) can have a right to convey or transfer it without his conſent, either tacitly or expreſsly given. This conſent may perhaps be tacitly given when an author permits his work to be publiſhed without any reſerve of right, and without ſtamping on it any marks of ownerſhip; it is then a preſent to the public, like the building of a church, or the laying out a new highway: but in caſe of a bargain for a ſingle impreſſion, or a total ſale or gift of the copyright; in the one caſe the reverſion hath been thought to continue in the original proprietor; in the other the whole property, with its excluſive rights, to be perpetually transferred to the grantee. On the other hand, it is urged, that though the excluſive right of the manuſcript, and all which it contains, belongs undoubtedly to the owner before it is printed or publiſhed; yet from the inſtant of publication, the excluſive right of an author or his aſſigns to the ſole communication of his ideas immediately vaniſhes and evaporates; as being a right of too ſubtile and unſubſtantial a nature to become the ſubject of property at the common law, and only capable of being guarded by poſitive ſtatute and ſpecial proviſions of the magiſtrate.

The Roman law adjudged, that if one man wrote any thing, though ever ſo elegantly, on the paper or parchment of another, the writing ſhould belong to the original owner of the materials on which it was written: meaning certainly nothing more thereby than the mere mechanical operation of writing, for which it directed the ſcribe to receive a ſatisfaction: eſpecially as, in works of genius and invention, ſuch as a picture painted on another man's canvas, the ſame law gave the canvas to the painter. We find no other mention in the law of any property in the works of the underſtanding, though the ſale of literary copies, for the purpoſes of recital or multiplication, is certainly as ancient as the times of Terence, Martial, and Statius. Neither with us in Britain hath there been (till very lately) any final determination upon the right of authors at the common law. It was determined in the caſe of *Miller* v. *Taylor* in *B. R. Paſch.* 9. Geo. III. 1760, that an excluſive copy-right in authors ſubſiſted by the common law. But afterwards, in the caſe of *Donaldſon*, v. *Becket*, before the houſe of lords, which was finally determined 22d February 1774, it was held, that no copy-right ſubſiſts in authors, after the expiration of the ſeveral terms created by the ſtatute 8 Ann. c. 19. This ſtatute declares, that the author and his aſſigns ſhall have the whole liberty of printing and reprinting his works for the term of 14 years, and no longer; and alſo protects that property by additional penalties and forfeitures; directing farther, that, if at the end of that term, the author himſelf be living, the right ſhall then return to him for another term of the ſame duration.

COQUES, Gonzalo, an eſteemed painter of portraits and converſations, was born at Antwerp in 1618, and was a diſciple of the old David Ryckaert; under whoſe direction he applied himſelf diligently to cultivate thoſe promiſing talents which he poſſeſſed; not only by practiſing the beſt rules adminiſtered to him by his inſtructor, but alſo by ſtudying nature with ſingular attention. He was a great admirer of Vandyck; and fixing on the manner of that great artiſt as his model, had the happineſs of ſo far ſucceeding, that next to him he was eſteemed equal to any other painter of his time. In the ſchool of Ryckaert he had been accuſtomed to paint converſations, and he frequently compoſed ſubjects of fancy like Teniers, Oſtade, and his maſter; and by that habit he introduced a very agreeable ſtyle of portrait-painting, in a kind of hiſtorical converſation, which ſeemed much more acceptable to perſons of taſte than the general manner of painting portraits, and procured him great reputation and riches. In that way he compoſed ſeveral fine pictures for King Charles I. and likewiſe ſeveral for the archduke Leopold, and the prince of Orange; which latter prince, as a mark of reſpect, preſented Coques with a rich gold chain, and a gold medal, on which the buſt of that prince was impreſſed. He died in 1684. He had an excellent pencil; his portraits were well deſigned, with eaſy natural attitudes; he diſpoſed the figures in his compoſition ſo as to avoid confuſion or embarraſſment: he gave an extraordinary clearneſs of colour to his heads and hands; and his touch was free, firm, and broad, a circumſtance very uncommon in works of a ſmall ſize.

COQUIMBO, a port town of Chili, in South America, ſituated at the mouth of a river of the ſame name, which diſcharges itſelf into the Pacific ocean. W. Long. 75. 10. N. Lat. 30. 8.

COR caroli, in *Aſtronomy*, an extra-conſtellated ſtar in the northern hemiſphere, ſituated between the *Coma Berenicis* and *Urſa major*, ſo called by Dr Halley in honour of King Charles.

Cor-Hydræ, a fixed ſtar of the firſt magnitude, in the conſtellation of Hydra.

Cor Leonis, in *Aſtronomy*, a fixed ſtar of the firſt magnitude in the conſtellation Leo.

Cor-meille, a noted plant, common in the highlands of Scotland. Its roots dried are the ſupport of the highlanders in long journeys, amidſt the barren hills deſtitute of the ſupports of life; and a ſmall quantity, like the alimentary powders, will for a long time repel the attacks of hunger. Infuſed in liquor it is an agreeable beverage, and, like the nepenthe of the Greeks, exhilarates the mind. From the ſimilitude of ſound in the name, it ſeems to be the ſame with chara, the root diſcovered by the ſoldiers of Cæſar at Dyrrhachium, which ſteeped in milk was ſuch a relief to the famiſhed army. Or we may reaſonably believe it to have been the Caledonian food deſcribed by Dio, of which the quantity of a bean would prevent both hunger and thirſt; and this, ſays the hiſtorian, they have ready for all occaſions.

CORACIAS, the Roller, a genus of birds of the order of picæ. See Ornithology *Index*.

CORACO-brachialis, in *Anatomy*, the name of a muſcle in the arm, ſerving to raiſe it upwards.

CORACOIDES, in *Anatomy*, a ſmall ſhort proceſs of the ſcapula. See Anatomy *Index*.

CORACOMANTES, in antiquity, perſons who foretold events from their obſervations on crows,

CORALLINA, or Coral, in *Zoology*, a genus belonging to the order of vermes zoophyta. See Helminthology *Index*.

CORAL Fishery. Red coral is found in the Mediterranean, on the ſhores of Provence, from Cape de la Couronne to that of St Tropez; about the iſles of Majorca and Minorca; on the ſouth of Sicily; on the coaſts of Africa; and, laſtly, in the Ethiopic ocean, about Cape Negro.

Coral-Stone, a name for a kind of red and white agate which breaks in veins, and is found in Italy and ſome parts of Saxony. That of Rochlitz in Saxony is the moſt celebrated, and is found in globules which have a kind of cruſt about them.

CORALLINES, a genus belonging to the vermes zoophyta. See Helminthology *Ixdex*.

CORALLODENDRON. See Erythrina, Botany *Index*.

CORALLOIDES (frutices). See Eschara and Keratophyta.

CORAM, *Captain* Thomas, a gentleman remarkably diſtinguiſhed by his humanity, was born about the year 1668, and ſpent the early part of his life in the ſtation of maſter of a veſſel trading to our colonies. Afterwards reſiding in the eaſtern part of the metropolis, among ſea-faring people, where buſineſs often obliged him to come early into the city, and return late, he frequently ſaw young children expoſed in the ſtreets through the indigence or cruelty of their parents. This excited his compaſſion, and induced him to project the foundation of an hoſpital for foundlings. In this humane deſign he laboured with indefatigable diligence for ſeventeen years; and by his application procured a number of the nobility and gentry to patronize and carry the ſcheme into execution, and at length obtained the royal charter for it. He was alſo highly inſtrumental in promoting the trade of America, by procuring a bounty upon naval ſtores imported from our colonies. He was likewiſe eminently concerned in ſetting on foot the colonies of Georgia and Nova Scotia. His laſt charitable deſign, in which he lived to make ſome progreſs, was a ſcheme for uniting the North American Indians more cloſely to the Britiſh intereſt, by an eſtabliſhment for the education of Indian girls. In ſhort, he ſpent the greateſt part of life in labouring for the public, and experienced a fate too common in thoſe who devote their talents to ſuch laudable purpoſes; being at laſt indebted for ſubſiſtence to the voluntary ſubſcriptions of ſome public-ſpirited perſons, at the head of whom was the late Frederic prince of Wales. Captain Coram died in 1751; and was interred, at his own deſire, in a vault under the chapel of the Foundling Hoſpital.

CORAN, or Alcoran. See Alcoran.

CORAX, the trivial name of a ſpecies of Corvus. See Ornithology *Index*.

CORANICH, among the Scotch and Iriſh, the cuſtom of ſinging at funerals, anciently prevalent in thoſe countries, and ſtill practiſed in ſeveral parts. Of this cuſtom Mr Pennant gives the following account. "I had not the fortune to be preſent at any in North Britain; but formerly aſſiſted at one in the ſouth of Ireland, where it was performed in the fulneſs of horror. The cries are called by the Iriſh the *ulogohne* and *hullulu;* two words very expreſſive of the ſound uttered on theſe occaſions; and being of Celtic ſtock, etymologiſts would ſwear to be the origin of the ολολυγων of the Greeks and *ululatus* of the Latins. Virgil is very fond of uſing the laſt whenever any of his females are diſtreſſed; as are others of the Roman poets, and generally on occaſions ſimilar to this. It was my fortune to arrive at a certain town in Kerry at the time that a perſon of ſome diſtinction departed this life; my curioſity led me to the houſe, where the funeral ſeemed conducted in the pureſt claſſical form.

Quodcunque aſpiceret luctus, gemituſque ſonabant,
Formaque non taciti funeris intus erat.

In ſhort, the *conclamatio* was ſet up by the friends in the ſame manner as Virgil deſcribes that conſequential of Dido's death;

Lamentis, gemituque, et fœmineo ululatu
Tecta fremunt.

Immediately after this followed another ceremony, fully deſcribed by Camden in his account of the manners of the ancient Iriſh; the earneſt expoſtulations and reproaches given to the deceaſed for quitting this world, where ſhe enjoyed ſo many bleſſings, ſo good a huſband, and ſuch fine children. This cuſtom is alſo of great antiquity, for Euryalus's mother makes the ſame addreſs to her dead ſon.

—— *Tunc illa ſenectæ*
Sera meæ requies? potuiſti reliquere ſolam,
Crudelis?

But when the time approached for carrying out the corps, the cry was redoubled,

Tremulis ululatibus æthera complent;

a numerous band of females waiting in the outer court to attend the hearſe, and to pay in chorus the laſt tribute of their voices. The habit of this ſorrowing train, and the neglect of their perſons, were admirably ſuited to the occaſion; their robes were black and flowing, reſembling the ancient palla; their feet naked, their hair long and diſhevelled: I might truly ſay,

Ut qui conducti plorant in funera, dicunt
Et faciunt prope plura dolentibus exanimo.

The corpſe was carried ſlowly along the verge of a moſt beautiful lake, the ululatus was continued, and the whole proceſſion ended among the venerable ruins of an old abbey."

CORBAN, in Jewiſh aniquity, were thoſe offerings which had life, in oppoſition to the *minchah*, or theſe which had not. It is derived from the word *karab*, which ſignifies "to approach;" becauſe the victims were brought to the door of the tabernacle. The corban were always looked upon as the moſt ſacred offerings. The Jews are reproached with defeating, by means of the corban, the precept of the fifth commandment, which enjoins the reſpect due to parents. For when a child had no mind to relieve the wants of his father or mother, he would ſay to them, "It is a gift (*corban*) by whatſoever thou mighteſt be profited by me;" i. e. "I have devoted that to God which you aſk of me, and it is no longer mine to give."

Corban is alſo a ceremony which the Mahometans perform at the foot of Mount Ariafat in Arabia, near Mecca. It conſiſts in killing a great number of ſheep, and diſtributing them among the poor.

CORBEILS, in *Fortification*, little baſkets about a foot and a half high, eight inches wide at the bottom and twelve at the top; which being filled with earth, are frequently ſet one againſt another upon the parapet or elſewhere, leaving certain port holes, from whence to fire upon the enemy under covert without being ſeen by them.

CORBEL, in *Architecture*, the repreſentation of a baſket, ſometimes ſeen on the heads of caryatides. The word is alſo uſed for the vaſe, or tambour, of the Corinthian column; ſo called from its reſemblance to a baſket, or becauſe it was firſt formed on the model of a baſket.

Corbel, or *Corbil*, is alſo uſed, in building, for a ſhort piece of timber placed in a wall, with its end ſticking out ſix or eight inches, as occaſion ſerves, in manner of a ſhouldering-piece. The under part of the end thus ſticking out is ſometimes cut into the form of a boultin; ſometimes of an ogee, and ſometimes of a face, &c. according to the workman's fancy; the upper ſide being plain and flat.

Corbel is alſo uſed by ſome architects for a niche or hollow left in walls for images, figures, or ſtatues to ſtand in.

CORBET, Richard, biſhop of Norwich, and an eminent poet, was born at Ewell in Surry, toward the latter end of the 16th century; and educated at Oxford, where he was eſteemed one of the moſt celebrated wits of the univerſity. Entering into holy orders, he became a popular preacher, and was made chaplain to King James I.: when, after ſeveral preferments in the church, he was, in 1629, made biſhop of Oxford; and, in 1632, was tranſlated to the ſee of Norwich. He was very hoſpitable, and always a generous encourager of public deſigns. He died in 1635. There have been ſeveral editions of his poems publiſhed under the title of *Poemata Stromata.*

CORBEY, a town of Picardy in France, with a famous abbey of Benedictine monks. It is ſeated on the river Somme, 10 miles eaſt of Amiens, and 75 north of Paris. E. Long. 2. 35. N. Lat. 49. 55.

CORCELET, in *Natural Hiſtory*, that part of the fly claſs which is analogous in its ſituation to the breaſt in other animals. Many have called it the breaſt in theſe alſo, but improperly; becauſe the breaſt of other animals is the place of the lungs and trachea, but theſe organs are in the fly claſs diſtributed through the whole body.

CORCHORUS, a genus of plants belonging to the polyandria claſs; and in the natural method ranking under the 37th order, *Columneæ*. See Botany *Index*.

CORCULUM, a diminutive from *cor* "the heart," little heart; the eſſence of a ſeed, and principle of life of the future plant, attached to and contained within the lobes. It conſiſts of two parts, termed by Linnæus Plumula and Rostellum. The former is the *radicula* of Grew and other naturaliſts. The corculum is in fact the embryo of the future vegetable; and is attached by two trunks of veſſels to the lobes at their union. The firſt of its two parts mounts upward, and becomes the trunk. The other ſtrikes into the ground, and is the rudiment of the root. The lobes and heart of the ſeed are diſtinctly viſible in the bean, and other ſeeds of that claſs, eſpecially after remaining ſome time in water or earth.

The principle of life is ſeated either at the ſummit or baſe of the ſeed. From this circumſtance are conſtructed the two firſt claſſes in Cæſalpinus's method, containing trees and ſhrubs only.

CORCYRA, in *Ancient Geography*, an iſland in the Ionian ſea, oppoſite to Theſprotia a diſtrict of Epirus, called *Scheria* and *Phæacia* by Homer. In Callimachus it is called *Drepane;* its moſt ancient name, according to the Scholiaſt, from the curvity of its figure. Famous for the ſhipwreck of Ulyſſes and the gardens of Alcinous. Now *Corfu.*

Corcyra, a cognominal town of the iſland; formerly powerful, and capable of coping with mighty ſtates; ſituated about the middle of the eaſt ſide of the iſland, called *The Town of the Phæacians* by Homer. Now *Corfu*, from the Κορυφω of the middle age, the name of the citadel. It was a colony of the Corinthians. *Corcyræi*, the people. E. Long. 19. 48. Lat. 39. 50.

Corcyra *Nigra*, an iſland in the Adriatic, on the coaſt of Dalmatia (Pliny); called *Melæna* by the Greeks, to diſtinguiſh it from the iſland in the Ionian ſea. The epithet *Nigra* was added, from its woods of tall trees with which it is almoſt covered. Now *Curzola.*

CORD, or Chord, an aſſemblage of ſeveral threads of hemp, cabled or twiſted together by means of a wheel. See Cordage. The word comes from the Greek χορδὴ, which properly ſignifies an inteſtine or gut, of which cords may be made. See Chord.

Magical Cord, an inſtrument in great uſe among the Laplanders, and by them ſuppoſed to be endued with a number of virtues. It is a cord or rope with three knots tied in it. They uſe many magical rites and ceremonies in the tying of this cord; and, when thus prepared, it is ſuppoſed to have power over the winds; and they will ſell, by means of it, a good wind, or at leaſt the promiſe of one, to a ſhip. If they untie only one of theſe knots, a moderate gale ſucceeds; if two, it is much ſtronger: and if three, a ſtorm is ſure to follow.

Cord *of Wood*, a certain quantity of wood for burning, ſo called becauſe formerly meaſured with a cord. The dimenſions of a ſtatute cord of wood are eight feet long, four feet high, and four feet broad.

CORD-*Wood*, is new wood, and ſuch as, when brought by water, comes on board a veſſel, in oppoſition to that which is floated.

CORDAGE, a term uſed in general for all ſorts of cord, whether ſmall, middling, or great. See ROPE.

The naval cordage of the earlier ages was in all probability only thongs of leather. Theſe primitive ropes were retained by the Caledonians in the third century. The nations to the north of the Baltic had them in the ninth or tenth centuries: and the inhabitants of the weſtern iſles of Scotland make uſe of them at preſent; cutting the ſkin of a ſeal, or the raw and ſalted hide of a cow, into long pieces, and faſtening the plough to their horſes with them, or even twiſting them into ſtrong ropes of 20 or 30 fathoms length. But theſe, in the ſouth of our iſland, and on the continent, were early ſuperſeded by the uſe of iron chains. The very maritime and commercial nation of the Veneti, that were ſo intimately connected with the Belgæ of Britain, uſed iron chains for their cables in the days of Cæſar. But in the more diſtant and refined countries of the ſouth, both thongs and theſe had long given place to the uſe of vegetable threads and the arts of combining them into ſtrength. In this manner the Greeks appear to have uſed the common ruſhes of their country, and the Carthaginians the ſpartum or broom of Spain. And as all the cordage of the Romans was made of theſe materials at their laſt deſcent on our iſland, ſo the art of manufacturing them would be neceſſarily introduced with the Roman ſettlements among the Britons. Under the direction of Roman artiſts their thongs of leather would naturally be laid aſide, and the junci, or ruſhes of the plains, worked up into cordage. And what remarkably coincides with this opinion is, that the remains of old cables and ropes are ſtill diſtinguiſhed among the Britiſh ſailors by the name of *old junk*.

The nations of Roman Britain, and the tribes of Caledonia and Ireland, had inherited, from their earlieſt anceſtors, many of the ruder arts of navigation. Their ſhips were large open boats, framed of light timbers ribbed with hurdles and lined with hides. Theſe were furniſhed with maſts and ſails. The latter were formed of hides, as the tackle was of thongs. They were actually of hides among the Veneti as late as the days of Cæſar; and they were never furled but only bound to the maſt. But theſe ſlight ſea-boats, and their rude furniture, would ſoon be diſmiſſed by the provincials for the more ſubſtantial veſſels and more artificial ſails of the Romans. The Roman ſails, which were compoſed of flax in the days of Agricola, were afterwards made of hemp; and our own are therefore denominated *cannabis* or *canvas* by our mariners at preſent. And about the ſame period aſſuredly did the junk of the Britiſh cordage give way to the ſame materials; the uſe of hempen ropes upon land, and of hempen nets for hunting, being very common among the Romans in the firſt century.

CORDATED, an appellation frequently given by naturaliſts to things ſomewhat reſembling a heart.

CORDED, in *Heraldry*. A croſs corded, ſome authors take for a croſs wound or wrenched about with cords: others, with more probability, take it for a croſs made of two pieces of cord.

CORDELERAS, mountains of South America, otherwiſe called ANDES.

CORDELIER, a Franciſcan, or religious of the order of St Francis. The Cordeliers are clothed in thick gray cloth, with a little cowl, a chaperon, and cloak of the ſame; having a girdle of rope or cord tied with three knots; whence the name.—They are otherwiſe called *Minor Friars*, their original name. The denomination *Cordelier* is ſaid to have been firſt given them in the war of St Louis againſt the infidels; wherein the Friars Minor having repulſed the barbarians, and that king having inquired their name, it was anſwered, they were people *cordeliez*, "tied with ropes." The Cordeliers are to a man profeſſed Scotiſts.

CORDEMOI, GERALDE, a learned philoſopher and hiſtorian, born at Paris, made himſelf known to M. Boſſuet, who placed him about the dauphin in the quality of reader. He inſtructed that young prince with great aſſiduity; and in 1675 was received into the French academy. He wrote a general hiſtory of France during the firſt races of the French kings, in two vols; and ſix diſcourſes on the diſtinction between Body and Soul, which were printed together in 1702 in quarto. He died in 1684. M. Cordemoi followed the principles of Deſcartes.

CORDIA, a genus of plants belonging to the pentandria claſs, and in the natural method ranking under the 41ſt order, *Aſperifoliæ*. See BOTANY *Index*.

CORDIAL, in *Medicine*, whatever raiſes the ſpirits, and gives them a ſudden ſtrength and cheerfulneſs; as wine, ſpirits, the effluvia of flowers, fruit, and many other ſubſtances.

CORDON, in *Fortification*, a row of ſtones, made round on the outſide, and ſet between the wall of the fortreſs which lies aſlope, and the parapet which ſtands perpendicular, after ſuch a manner, that this difference may not be offenſive to the eye; whence the cordons ſerve only as an ornament, ranging round about the place, being only uſed in fortifications of ſtone-work: for in thoſe made with earth the void ſpace is filled up with pointed ſtakes.

CORDUBA, in *Ancient Geography*, an illuſtrious city of Bætica, on the right or north ſide of the Bætis. Built by Marcellus, according to Strabo; but which Marcellus is not ſo clear. It was the firſt colony ſent into thoſe parts by the Romans; and ſurnamed *Patricia*, becauſe at firſt inhabited by principal men, both of the Romans and natives. It is mentioned by Sil. Italicus in the ſecond Punic war; and hence it is probable the firſt Marcellus was the founder, and not the Marcellus engaged in the civil war between Cæſar and Pompey. It was famous for the birth of the two Senecas and of Lucan (Martial), and for its rich produce in oil (Statius, Martial). Still retaining its name a little altered. W. Long. 5. Lat. 37. 45.

CORDOUA, or CORDOVA, a city of Andaluſia in Spain, ſituated on the river Guadelquiver, in a very extenſive plain. The circumference is large; but it is not peopled in proportion to its extent, for there are a great many orchards and gardens within the walls. There are many ſuperb ſtructures, palaces, churches, and religious houſes; particularly the cathedral, which is very magnificent: It was formerly a moſque when the Moors poſſeſſed the town; for which reaſon it ſtill retains the name of *Mezquita*, which has the ſame meaning. The cathedral is very rich in plate; four of the ſilver candleſticks coſt 850l. a-piece. The revenue of the ſee amounts to 3500l. per annum; but as the biſhops cannot deviſe by will, all they die poſſeſſed of eſcheats to the crown. The ſquare called the *Plaza Major* is ſurrounded with very fine houſes, under which are piazzas. The trade is flouriſhing on account of the river; and conſiſts of wine, ſilk, and Cordovan leather. In the neighbourhood of this place are a vaſt number of orange and lemon trees, which renders their fruits exceeding cheap. The beſt horſes in Spain come from hence.

Cordova was the ancient *Corduba* mentioned in the preceding article. After the fall of the Roman empire, it was ſubjected to the dominion of the Goths; but in the eighth century it was raiſed by the Mooriſh princes to a ſtate of ſplendor unequalled in any other part of the world. In the year 755, Abdoulrahman, only heir-male of the Ommiad line, having paſſed over from Africa at the head of a few deſperate followers, found means to raiſe a rebellion in Spain; when, after a battle fought on the banks of the Guadelquiver, in which he overthrew the lieutenant of the Abaſſid caliph of Damaſcus, he became king of all the Mooriſh poſſeſſions in the ſouth of Spain, and in 759 fixed his royal reſidence at Cordova. Then began thoſe flouriſhing ages of Arabian gallantry and magnificence which rendered the Moors of Spain ſuperior to all their cotemporaries in arts and arms, and made Cordova one of the moſt ſplendid cities of the world. Agriculture and commerce proſpered under the happy ſway of this hero; and the face of the country was changed from a ſcene of deſolation, which the long wars and harſh government of the viceroys had brought on, into a moſt populous flouriſhing ſtate, exceeding in riches, number of inhabitants, activity, and induſtry, any prior or ſubſequent era of the Spaniſh hiſtory. He added new fortifications to the town, built himſelf a magnificent palace with delicious gardens, laid cauſeways through the marſhes, made excellent roads to open ready communication between the great towns, and in 786 began the great moſque, which he did not live to finiſh.

During the courſe of two centuries, this court continued to be the reſort of all profeſſors of the polite arts, and of ſuch as valued themſelves upon their military and knightly accompliſhments; whilſt the reſt of Europe was buried in ignorance, debaſed by brutality of manners, or diſtracted by ſuperſtitious diſputes. England, weakened by its heptarchy, was too inconſiderable even to be mentioned in the political hiſtory of the times. France, though it had a gleam of reputation under Charlemagne, was ſtill a barbarous unpoliſhed nation; and Italy was in utter confuſion; the frequent revolutions and change of maſters rendering it impoſſible for learning, or any thing good, to acquire a permanent footing in ſo unſtable a ſoil: Greece, though ſtill in poſſeſſion of the arts and luxury of ancient Rome, had loſt all vigour, and ſeemed abſorbed in the moſt futile of all purſuits, viz. that of ſcholaſtic argument and religious ſubtilities.

The reſidence of the Ommiad caliphs was long conſpicuous for its ſupreme magnificence, and the crowds of learned men who were allured to it by the protection offered by its ſovereigns, the beauty of the country, the wholeſomeneſs of the climate, and the variety of pleaſures that returned inceſſantly in one enchanting round.

Cordova became the centre of politeneſs, induſtry, and genius. Tilts and tournaments, with other coſtly ſhows, were long the darling paſtimes of a wealthy happy people; and this was the only kingdom in the weſt where geometry, aſtronomy, and phyſic, were regularly ſtudied and practiſed. Muſic was no leſs honoured; for we find, that in 844 a famous muſician called *Ali Zeriab* came to ſettle at Cordova, and formed ſeveral pupils, who were ſuppoſed to equal the moſt celebrated performers that were ever known even in the Eaſt. That architecture was greatly encouraged, we need no other proof than the great and expenſive fabrics undertaken and completed by many of theſe Spaniſh monarchs. Whatever faults may be juſtly condemned in their manner by the connoiſſeur, accuſtomed to the chaſte noble graces of the Grecian proportions, certainly nobody can behold what remains of theſe Mooriſh edifices, without being ſtrongly impreſſed with a high idea of the genius of the artiſts, as well as the grandeur of the prince who carried their plans into execution.

The ſultans not only gave the moſt diſtinguiſhed protection to arts and ſciences, and to the perſons learned in any of them, but were themſelves eminently verſed in various branches of knowledge. Alkahem II. collected ſo immenſe a quantity of manuſcripts that before the end of his reign the royal library contained no leſs than 600,000 volumes, of which the very catalogue filled 40 huge folios. The univerſity of Cordova was founded by him, and under ſuch favourable auſpices roſe to the higheſt pitch of celebrity.

Abdoulrahman was ſucceeded by his ſon Hiſſem, whoſe paſſion for glory and architecture was not in the leaſt inferior to that of his father. He put the finiſhing hand to the moſque, which the plunder of the ſouthern provinces of France enabled him to complete in the courſe of a few years. The bridge over the Guadelquiver was a work of Hiſſem's after his own plan.

Alkahem ſucceeded Hiſſem.

Abdoulrahman II. was alſo paſſionately fond of building. He was the firſt that brought the ſupplies of water to Cordova by means of leaden pipes laid upon aqueducts of ſtone. The quantity was ſo conſiderable, that every part of the palace, the moſques, baths, ſquares, and public edifices, had all of them their fountains conſtantly playing. A great many of theſe works ſtill ſubſiſt. He paved the whole city, and erected ſeveral moſques.

After him reigned Mahomet Almundar, Abdallah, and Abdoulrahman III. who ſurpaſſed all his predeceſſors in ſplendor, riches, and expence. His ſubjects vied with each other in profuſion and magnificence. This monarch was ſucceeded by his ſon Alkahem II. who left a minor to ſucceed him, and the kingdom to be governed by the famous viſir Mahomet Abenamir, ſurnamed *Almanzor*, or "the defender," from his great victories and wiſe conduct. His deſcendants inherited from him the viſirſhip, and a power as abſolute as if they had been caliphs, until the weakneſs of the ſovereigns encouraged, and the inſolence of the miniſters provoked, the grandees to diſturb the ſtate with their jealouſies and diſſenſions. Theſe broils occaſioned ſuch a ſeries of civil war and anarchy, as overthrew the throne of Cordova, and deſtroyed the whole race of Abdoulrahman. Thus the glorious edifice, founded by the valour and prudence of that conqueror, and cemented by ſimilar virtues in many of his ſucceſſors, ſunk into nothing as ſoon as the ſceptre devolved upon weak enervated princes, whoſe indolence and incapacity transferred the management of every thing to a viſir. Many petty kingdoms ſprung up out of the ruins of this mighty empire; and the Chriſtians ſoon found opportunities of deſtroying, by ſeparate attacks, that tremendous power, which when united had proved an overmatch for their utmoſt force.

New **CORDOUA**, a conſiderable town of South America, in the province of Tucuman, with a biſhop's ſee, 175 miles from St Jago. W. Long. 62. 5. S. Lat. 32. 10.

CORDUAN, a famous pharos or light-houſe of France, in Guienne, at the mouth of the river Girond. The architecture is extremely fine; and it is placed there to hinder veſſels from running on the ſand-banks at the mouth of the river. W. Long. 1. 9. N. Lat. 45. 36.

CORDUS, VALERIUS, a learned botaniſt, was the ſon of Ericius Cordus, a phyſician and poet of Germany. Having learned the languages, he applied himſelf to the ſtudy of botany, in the proſecution of which he examined the mountains of Germany, and travelled into Italy; but being wounded in the leg by the kick of a horſe, died at Rome in 1554. He wrote Remarks on Dioſcorides, and other works.

CORDWAINERS, or **CORDINERS**, the term whereby the ſtatutes denominate *ſhoemakers*. The word is formed from the French *cordonnier*, which Menage derives from *corduan*, a kind of leather brought from Cordoua, whereof they formerly made the upper leathers of their ſhoes. Others derive it from *corde* "rope," becauſe anciently ſhoes were made of cords; as they ſtill are in ſome parts of Spain, under the name of *alpargates*. But the former etymology is better warranted; for, in effect, the French workmen who prepare the corduas are ſtill called *cordouanniers*.

In Paris they have two pious ſocieties under the title of *freres cordonniers*, "brothers ſhoemakers," eſtabliſhed by authority towards the middle of the 17th century; the one under the protection of St Criſpin *, the other of St Criſpianus, two ſaints who had formerly honoured the profeſſion. They live in community, and under fixed ſtatutes and officers; by which they are directed both in their ſpiritual and ſecular concerns. The produce of their ſhoes goes into a common ſtock, to furniſh neceſſaries for their ſupport; the reſt to be diſtributed among the poor.

* See *Criſpin*.

COREA, a peninſula lying to the north-eaſt of China, between 99 and 109 degrees of E. Long. and between 32 and 46 of N. Lat. It is divided into 8 provinces, which contain 40 cities of the 1ſt rank, 51 of the 2d, and 70 of the 3d. The capital of the whole is Han-ching, where the king reſides. The Jeſuits ſay, the people are well made, of a ſweet and tractable diſpoſition, and fond of learning, muſic, and dancing, and in general reſemble the Chineſe. The houſes are mean, being covered with thatch; and they have no beds, but lie on the floor. They have little ſilk, and therefore make uſe of linen cloth in its room. Their trade conſiſts in white paper, pencils, ginſeng, gold, ſilver, iron, yellow varniſh, fowls whoſe tails are three feet long, horſes no more than three feet in height, ſable ſkins, caſtor, and mineral ſalt. In general it is a fertile country, though abounding in mountains. It is tributary to China.

M. Groſier relates an obſervation concerning the natural hiſtory of Corea, which, in his opinion, furniſhes a new proof of the revolutions which the ſurface of our globe has undergone. An ancient Chineſe book aſſerts, that the city where Kipe, the king of Corea, eſtabliſhed his court, was built in a place which forms at preſent a part of the territories of *Yong-ping-fou*, a city of the firſt claſs in the province of Petcheli. "If this (ſays he) be admitted as a fact, we may from thence conclude, that theſe territories formerly belonged to Corea; and that the gulf of Lea-tong, which at preſent ſeparates this kingdom from the province of Petcheli, did not then exiſt, and that it has been formed ſince; for it is not probable that the ſovereign would have fixed his reſidence without the boundaries of his kingdom, or in a place where he was ſeparated from it by a wide and extenſive ſea. This conjecture is confirmed by certain facts admitted by the Chineſe. Thus when *Yu*, ſurnamed the *Great*, undertook to drain and carry off the waters which had inundated the low grounds of ſeveral provinces, he began by the river Hoang-ho, the overflowing of which cauſed the greateſt devaſtation. He went in ſearch of its ſource to the boſom of Tartary, from whence he directed its courſe acroſs the provinces of Chan-ſi, Chen-ſi, Honan, and Petcheli. Towards its mouth, in order to weaken the rapidity of its waters, he divided them into nine channels, through which he cauſed the river diſcharge itſelf into the eaſtern ſea near the mountain of *Kie-che-chan*, which then formed a promontory. Since that time to the preſent, that is, about 3950 years, the river Hoang-ho has departed ſo much from its ancient courſe, that its mouth at preſent is about ſix degrees farther ſouth. We muſt alſo remark, that the mountain Kie-che-chan, which was formerly united to the main land of Yong-ping-fou, ſtands at preſent in the ſea at the diſtance of about 50 leagues to the ſouth of that city. If the ſea has been able to cover with its waters that extent of territory which at preſent forms part of the gulf of Lea-tong, may we not be allowed to ſuppoſe that like inundations may have formed ſucceſſively the whole of that gulf, the ancient exiſtence of which ſeems ſo ill to agree with the reſidence of the kings of Corea in the territories of Yong-ping-fou? It is true, the Chineſe hiſtory makes no mention of ſo conſiderable a phyſical revolution: but it is equally ſilent with regard to the 500 *lys* (50 leagues) extent of ground which is at preſent covered by the ſea beyond the mountains of Kie-che-chan. Beſides, of all the changes which the ſurface of our globe experiences, thoſe only are mentioned in hiſtory which happen ſuddenly, and which conſequently make more impreſſion on the minds of men.

Corea chiefly produces wheat, rice, and ginſeng, with a kind of palm tree which yields a gum capable of producing a yellow varniſh little inferior to gilding. Hence alſo are exported caſtor and ſable ſkins; alſo gold, ſilver, iron, and foſſil ſalt; a kind of ſmall bruſhes for painting, made of the hair of a wolf's tail, are likewiſe manufactured here, which are exported to China and highly eſteemed there. The ſea coaſts abound in fiſh, and great numbers of whales are found there every year towards the north-eaſt. Several of theſe, it is ſaid, have in their bodies the harpoons of the French and Dutch, from whom they have eſcaped in the northern extremities of Europe; which ſeems to indicate a paſſage from the European into the Aſiatic ſeas round the continents of Europe and Aſia.

A conſiderable quantity of the paper of Corea is annually imported into China; indeed the tribute due to the emperor is partly paid with it every year. It is made of cotton, and is as ſtrong as cloth, being written upon with a ſmall hair-bruſh or pencil; but muſt be done over with alum-water before it can be written upon in the European manner. It is not purchaſed by the Chineſe for writing, but for filling up the ſquares of their ſaſh-windows; becauſe, when oiled, it reſiſts the wind and rain better than that of China. It is uſed likewiſe as wrapping paper; and is ſerviceable to the tailors, who rub it between their hands until it becomes as ſoft and flexible as the fineſt cotton cloth, inſtead of which it is often employed in lining clothes. It has alſo this ſingular property, that if it be too thick for the purpoſe intended, it may be eaſily ſplit into two or three leaves, each of which is even ſtronger than the beſt paper of China.

The Coreans are well made, ingenious, brave, and tractable; are fond of dancing, and ſhow great docility in acquiring the ſciences, to which they apply with great ardour, and which they honour in a particular manner. The northern Coreans are larger ſized and more robuſt than thoſe of the ſouth; have a taſte for arms, and become excellent ſoldiers. Their arms are croſsbows and long ſabres. Men of learning are diſtinguiſhed from other claſſes of people by two plumes of feathers in their caps; and when merchants preſent the Coreans with any books for ſale, they dreſs themſelves in the richeſt attire, and burn perfumes before they treat concerning the price.

The Coreans mourn three years, as in China, for a father or mother: but the time of mourning for a brother is confined to three months. Their dead are not interred until three years after their deceaſe; and when the ceremony of interment is performed, they place around the tomb the clothes, chariot, and horſes of the deceaſed, with whatever elſe he ſhowed the greateſt fondneſs for while alive; all which they leave to be carried off by the aſſiſtants. Their houſes, as in China, conſiſt only of one ſtory, and are very ill built; in the country being compoſed of earth, and in cities generally of brick, but all thatched with ſtraw; the walls of their cities are conſtructed after the Chineſe manner, with ſquare turrets, battlements, and arched gates. Their writing, dreſs, religious ceremonies, and creed, as well as the greater part of their cuſtoms, are borrowed from the Chineſe. Their women, however, are leſs confined, and have the liberty of appearing in public with the other ſex, for which they are often ridiculed by their neighbours. They differ from the Chineſe alſo in their ceremonies of marriage, and in the manner of contracting it; the parties in this country taking the liberty to chooſe for themſelves, without conſulting the inclinations of their parents, or ſuffering them to throw any obſtacles in their way.

CORElA, in antiquity, a feſtival in honour of Proſerpine, named *Core*, Κορα, which, in the Moloſſian dialect ſignifies a beautiful woman.

CORELLI, Arcangelo, the famous Italian muſician and compoſer, a native of Fuſignano, in the territory of Bologna, was born in 1653. He entertained an early propenſity to the violin; and as he advanced in years, laboured inceſſantly in the practice of that inſtrument. About the year 1672, his curioſity led him to viſit Paris, probably with a view to attend the improvements which were making in muſic under the influence of Cardinal Mazarin, and in conſequence of the eſtabliſhment of a royal academy; but notwithſtanding the character which he brought with him, he was driven back to Rome by Lully, whoſe jealous temper could not brook ſo formidable a rival as this illuſtrious Italian. In the year 1680 he viſited Germany, and met with a reception ſuitable to his merit from moſt of the German princes, particularly the elector of Bavaria; in whoſe ſervice he was retained, and continued for ſome time. After about five years ſtay abroad, he returned again to Rome, and there purſued his ſtudies with great aſſiduity.

The proficiency of Corelli on his favourite inſtrument the violin was ſo great, that the fame of it ſpread throughout Europe. The ſtyle of his performance was learned, elegant, and pathetic; and his tone firm and even. Mr Geminiani, who was well acquainted with, and had ſtudied it, uſed to reſemble it to a ſweet trumpet. A perſon who had heard him perform ſays, that, whilſt he was playing on the violin, it was uſual for his countenance to be diſturbed, his eyes to become as red as fire, and his eye-balls to roll as in an agony.

Corelli was highly favoured by that great patron of poetry and muſic, Cardinal Ottoboni. Creſcembini ſays, that he regulated the muſical academy held at the palace of his eminence every Monday afternoon. Here it was that Mr Handel became acquainted with him; and in this academy a ſerenata of Mr Handel, entitled *Il Trionfo del Tempo*, was performed, the overture to which was in a ſtyle ſo new and ſingular, that Corelli was confounded in his firſt attempt to play it.

During the reſidence of Corelli at Rome, beſides thoſe of his own country, many perſons were ambitious of becoming his diſciples, and learning the practice of the violin from the greateſt maſter on that inſtrument the world had then heard of. Of theſe it is ſaid the late Lord Edgecumbe was one: and that the fine mezzotinto print of Corelli by Smith was ſcraped from a picture painted by Mr Hugh Howard at Rome for that nobleman.

Corelli died at Rome in 1713; and was buried in the church of the Rotunda, otherwiſe called the Pantheon, in the firſt chapel on the left hand of the entrance. Over the place of his interment is a ſepulchral monument to his honour, with a marble buſt thereon, erected at the expence of Philip William, count palatine of the Rhine, under the care and direction of Cardinal Ottoboni.

For many years after his deceaſe, this excellent muſician was commemorated by a ſolemn muſical performance in the Pantheon, on the anniverſary of his death. In the year 1730 an eminent maſter, now living, was preſent at that ſolemnity, who relates that at it the third and eighth of his concertos were performed by a numerous band, among whom were many who had been the pupils of the author. He adds, that theſe two pieces were performed in a ſlow, diſtinct, and firm manner, without graces, and juſt as they are wrote; and from hence concludes, that this was the manner in which they were played by the author himſelf.

He died poſſeſſed of about 6000l. ſterling. He was a paſſionate admirer of pictures, and lived in an uninterrupted friendſhip with Carlo Cignani and Carlo Marat: theſe two eminent painters were rivals for his favour; and for a ſeries of years preſented him at times with pictures, as well of other maſters as of their own painting. The conſequence was, that Corelli became poſſeſſed of a large and valuable collection of original paintings; all which, together with the ſum abovementioned, he bequeathed to his dear friend and patron Cardinal Ottoboni, who, reſerving the pictures to himſelf, generouſly diſtributed the reſt of his effects among the relations of the teſtator.

Corelli is ſaid to have been remarkable for the mildneſs of his temper and the modeſty of his deportment; nevertheleſs, he was not inſenſible of the reſpect due to his ſkill and exquiſite performance. Cibber, in the Apology for his Life, p. 340. relates, that when he was playing a ſolo at Cardinal Ottoboni's, he diſcovered the cardinal and another perſon engaged in diſcourſe, upon which he laid down his inſtrument; and being aſked the reaſon, gave for anſwer, that he feared the muſic interrupted their converſation.

The compoſitions of Corelli are celebrated for the harmony reſulting from the union of all the parts; but the fineneſs of the airs is another diſtinguiſhing characteriſtic of them: the allemand in the 10th ſolo is as remarkable for ſpirit and force, as that in the 11th is for its enchanting delicacy; his jigs are in a ſtyle peculiarly his own: and that in the 5th ſolo was never equalled. In the gavot movements in the 2d and 4th operas, the melody is diſtributed with great judgment among the ſeveral parts. In his minuets alone he ſeems to fail; Bononcini, Mr Handel, and Guiſeppe Martini, have excelled him in this kind of airs.

It is ſaid there is in every nation a ſtyle both in ſpeaking and writing, which never becomes obſolete; a certain mode of phraſeology, ſo conſonant and congenial to the analogy and principles of its reſpective language, as to remain ſettled and unaltered. This, but with much greater latitude, may be ſaid of muſic; and accordingly it may be obſerved of the compoſitions of Corelli, not only that they are equally intelligible to the learned and unlearned, but that the impreſſions made by them have been found to be as durable in general. His muſic is the language of nature; and, for a ſeries of years, all that heard it became ſenſible of its effects: of this there cannot be a ſtronger proof than that, amidſt all the innovations which the love of change had introduced, it continued to be performed, and was heard with delight, in churches, in theatres, at public ſolemnities and feſtivities, in all the cities of Europe, for near 40 years. Men remembered, and would refer to paſſages in it as to a claſſic author; and even at this day, the maſters of the ſcience do not heſitate to pronounce of the compoſitions of Corelli, that, of fine harmony and elegant modulation, they are the moſt perfect examplars.

COREOPSIS, TICKSEEDED SUNFLOWER; a genus of plants belonging to the ſyngeneſia claſs; and in the natural method ranking under the 49th order, *Compoſitæ*. See BOTANY *Index*.

CORFE-CASTLE, a borough-town in Dorſetſhire in England. It takes its name from a ſtrong caſtle, belonging to the crown, that ſtood there, but is now in ruins. It ſends two members to parliament. W. Long. 2. 8. N. Lat. 50. 33.

CORFU, an iſland in the Ionian ſea, at the mouth of the gulf of Venice, formerly called *Corcyra* and *Phæacia*, famous for the gardens of Alcinous. It belongs at preſent to the Venetians; and forms the bulwark of Chriſtendom againſt the Turks, who have often attempted to reduce it, but without ſucceſs. It is well fortified, and has 50 caſtles; and the number of the inhabitants is ſaid to be about 50,000. The inhabitants are of the Greek church; and the Venetians ſend them a governor and magiſtrates, which are changed every two years. The ſoil is very fruitful, and produces a great deal of wine, olives, and ſeveral other fruits, particularly figs, which are exceedingly good. The chief city is likewiſe called *Corfu*: ſee the following article.

CORFU, a city of the iſland of that name, belonging to the Venetians. It is a large place, ſtrongly fortified, and defended by a garriſon of about 10,000 men; which, however, in the opinion of a late traveller, do not appear adequate to the extent of the fortifications. A number of very excellent braſs and iron cannon are mounted on the different forts, which, he obſerves, are ſo divided, that it would take treble the number of their garriſon to defend them. However, the republic of Venice is generally at peace with the different European nations, and the ancient power of the Turks being much decayed, they have little to apprehend; though to prevent any ſudden ſurpriſe, the Venetians keep a formidable ſquadron in the harbour of Corfu, and the works have been much improved by Major General Paterſon.—In the late war they had with the Turks, this town was attacked by an army of 80,000 men, and attempted to be ſtormed ſeveral times by the enemy; but the garriſon, which conſiſted of 12,000 men, under the command of Count Schulenburg, made ſo brave and gallant a defence, that they always repulſed them, and obliged them to raiſe the ſiege, and abandon the place with conſiderable loſs. For this piece of ſervice the republic has cauſed a magnificent ſtatue to be erected in memory of the count, with an elegant Latin inſcription, ſetting forth the many eminent ſervices of his military atchievements. The circumference of the city is about four miles; the number of inhabitants on the whole iſland is computed at about 50,000, the greateſt part of whom are Greeks.

This iſland is the reſidence of the governor general, whoſe juriſdiction extends over all the iſlands ſubject to the republic of Venice, in the Levant ſeas, and is conſidered as one of the greateſt honours they can confer on a ſubject. He is always a nobleman of the firſt rank, and has his appointment for three years only, in which time he makes a tolerable addition to his fortune, and on his return to Venice is generally advanced to the honours of the ſenate. In the city are many handſome Greek churches, the principal of which is that of St Speridione, or the cathedral. It is embelliſhed with ſome excellent paintings, and moſt ſuperbly ornamented. The body of the ſaint from whom it was named, is preſerved entire in a rich ſhrine within the church. The Greeks are moſt of them ſuch fanatics as to be continually offering their devotions at this ſhrine, believing that through the interceſſion of the ſaint they will obtain all their wants; and that by offerings of money their ſins will be forgiven them; by which means the church has amaſſed an immenſe treaſure. The relic of the ſaint is depoſited in a ſilver coffin, richly decorated with precious ſtones. It is in an amazing ſtate of preſervation: he having died in the iſland of Cyprus upwards of 700 years ago; and after remaining 400 years there, was tranſported to this place.—Beſides the grand fleet, the Venetians have another of galleys, that are manned by convicts whoſe crimes are not of ſuch a nature as to merit death. The chief diverſions of this place in the winter are operas; they have always a company of comedians for the ſeaſon from Naples. In the ſummer they paſs their time in walking upon the ramparts; few except the governor and great officers of ſtate are permitted to keep carriages. The Corfu people perfectly reſemble the Zanteots in their manners (ſee Zante); though it muſt be obſerved, in praiſe of the former, that aſſaſſinations are uncommon among them, their laws being too ſevere to permit ſuch practices with impunity. E. Long. 19. 48. N. Lat. 39. 50.

CORIA, a town of Spain, in the kingdom of Leon and province of Eſtremadura, towards the confines of Portugal, with a biſhop's ſee. It is ſeated on a little river called *Alagon*, in a very fertile plain. There is nothing remarkable but the cathedral church, except at a little diſtance a river without a bridge, and a bridge without a river. This was cauſed by an earthquake, which turned the river another way. W. Long. 6. 46. N. Lat. 39. 59.

CORIANDRUM, coriander; a genus of plants belonging to the pentandria claſs; and in the natural method ranking under the 45th order, *Umbellatæ*. See Botany *Index*.

CORIARIA, *Tanners* or *Myrtle-leafed* Sumach; a genus of plants belonging to the diœcia claſs; and in the natural method ranking under the 54th order, *Miſcellaneæ*. See Botany *Index*. This plant is much uſed in the ſouth of France, where it grows naturally, for tanning of leather, whence its name of *tanner's ſumach*. It alſo dyes a beautiful black colour.

CORIDOR, or Corridor, in *Fortification*, a road or way along the edge of the ditch, without-ſide; encompaſſing the whole fortification. The word comes from the Italian *coridore*, or the Spaniſh *coridor*. It is alſo called the *covert-way*, becauſe covered with a glacis, or eſplanade, ſerving it as a parapet.—The coridor is about 20 yards broad.

Coridor is alſo uſed in architecture for a gallery or long aiſle around a building, leading to ſeveral chambers at a diſtance from each other, ſometimes wholly incloſed, and ſometimes open on one ſide.

CORINNA, a Grecian lady, celebrated for her beauty and poetic talents, was born at Theſſa, a city of Bœotia, and was the diſciple of Myrtis another Grecian lady. Her verſes were ſo eſteemed by the Greeks, that they gave her the name of the *lyric muſe*. She lived in the time of Pindar, about 495 years before Chriſt; and is ſaid to have gained the prize of lyric poetry from that poet; but Pauſanias obſerves that her beauty made the judges partial.

CORINTH, a celebrated city of antiquity, for ſome time the moſt illuſtrious of all the Greek cities. It is ſaid to have been founded 1514 years before Chriſt, by Siſyphus the ſon of Molus, and grandfather of Ulyſſes. Various reaſons are given for its name, but moſt authors derive it from *Corinthus* the ſon of Pelops. It was ſituated on the ſouth part of the iſthmus which joins the Peloponneſus, now the Morea, to the continent. It conſiſted of a citadel built upon an eminence, and thence named *Acrocorinthus*; beſides which it had two maritime towns ſubject to it, named *Lecheum* and *Cenchreæ*. The whole ſtate extended ſcarce half a degree in length or breadth; but ſo advantageouſly were the above-mentioned ports ſituated, that they might have gained the Corinthians a ſuperiority, if not a command, over all Greece, had not their advantageous ſituation inclined them to commerce rather than war. For their citadel was almoſt impregnable; and commanding both the Ionian and Ægean ſeas, they could eaſily cut off all communication from one half of Greece with the other; for which reaſon this city was called one of the fetters of Greece.

But as the genius of the Corinthians led them to commerce rather than martial exploits, their city became the fineſt in all Greece. It was adorned with the moſt ſumptuous buildings, as temples, palaces, theatres, porticoes, &c. all of them enriched with a beautiful kind of columns, which from the city were called *Corinthian*. But though the Corinthians ſeldom or never engaged in a war with a view of enlarging but rather of defending their little ſtate, they did not forget to cultivate a good diſcipline both in time of peace and of war. Hence many brave and experienced generals have been furniſhed by Corinth to the other Grecian cities, and it was not uncommon for the latter to prefer a Corinthian general to any of their own.

This city continued to preſerve its liberty till the year before Chriſt 146, when it was pillaged and burnt by the Romans. It was at that time the ſtrongeſt place in the world: but the inhabitants were ſo diſheartened by a preceding defeat, and the death of their general, that they had not preſence of mind enough even to ſhut their gates. The Roman conſul Mummius, was ſo much ſurpriſed at this, that at firſt he could ſcarce believe it; but afterwards fearing an ambuſcade, he advanced with all poſſible caution. As he met with no reſiſtance, his ſoldiers had nothing to do but deſtroy the few inhabitants that had not fled, and plunder the city. Such of the men as had ſtaid were all put to the ſword, and the women were ſold for ſlaves. After this the city was ranſacked by the greedy ſoldiers, and the ſpoils of it are ſaid to have been immenſe. There were more veſſels of all ſorts of metal, more fine pictures and ſtatues done by the greateſt maſters, in Corinth, than in any other city in the world. All the princes of Europe and Aſia who had any taſte in painting and ſculpture furniſhed themſelves here with their richeſt moveables: here were caſt the fineſt ſtatues for temples and palaces, and all the liberal arts brought to their greateſt perfection. Many ineſtimable pieces of the moſt famous painters and ſtatuaries fell into the hands of the ignorant ſoldiers, who either deſtroyed them, or parted with them for a trifle. Polybius the hiſtorian was an eye witneſs to this barbariſm of the Romans. He had the mortification to ſee two of them playing at dice on a famous picture of Ariſtides, which was accounted one of the wonders of the world. The piece was a Bacchus, ſo exquiſitely done, that it was proverbially ſaid of any extraordinary performance, "It is as well done as the *Bacchus of Ariſtides*." This maſterly piece of painting, however, the ſoldiers willingly exchanged for a more convenient table to play upon; but when the ſpoils of Corinth were put up to ſale, Attalus king of Pergamus offered for it 600,000 ſeſterces, near 5000l. of our money. Mummius was ſurpriſed at ſuch a high price offered for a picture, and imagined there muſt be ſome magical virtue in it. He therefore interpoſed his authority, and carried it to Rome, notwithſtanding the complaints of Attalus. Here this famous picture was lodged in the temple of Ceres, where it was at laſt deſtroyed by fire, together with the temple. Another extraordinary inſtance of the ſtupidity of Mummius is, that when the pictures were put on board the tranſports, he told the maſters of the veſſels very ſeriouſly, that if any of the things were either loſt or ſpoiled, he would oblige them to find others at their own coſt; as if any other pieces could have ſupplied the loſs of thoſe ineſtimable originals, done by the greateſt maſters in Greece. When the city was thoroughly pillaged, fire was ſet to all the corners of it at the ſame time. The flames grew more violent as they drew near the centre, and at laſt uniting there made one prodigious conflagration. At this time the famous metalline mixture is ſaid to have been made, which could never afterwards be imitated by art. The gold, ſilver, and braſs, which the Corinthians had concealed, were melted, and ran down the ſtreets in ſtreams, and when the flames were extinguiſhed, a new metal was found, compoſed of ſeveral different ones, and greatly eſteemed in after ages.

The town lay deſolate until Julius Cæſar ſettled there a Roman colony; when, in moving the rubbiſh and digging, many vaſes were found of braſs or earth finely emboſſed. The price given for theſe curioſities excited induſtry in the new inhabitants. They left no burying-place unexamined; and Rome, it is ſaid, was filled with the furniture of the ſepulchres of Corinth.

Strabo was at Corinth ſoon after its reſtoration by the Romans. He deſcribes the ſite as follows. "A lofty mountain, in perpendicular height as much as three ſtadia and a half (near half a mile), the aſcent 30 ſtadia ($3\frac{1}{4}$ miles), ends in a pointed ſummit called *Acrocorinthus*. Of this the portion to the north is the moſt ſteep: beneath which lies the city on a level area at the foot of the Acrocorinthus. The circuit of the city alone has been 40 ſtadia (5 miles), and as much of it as was unſheltered by the mountain has been walled about. Within the incloſure was comprehended alſo the Acrocorinthus, where the mountain was capable of receiving a wall; and as we aſcended, the veſtiges were plain; ſo that the whole circumference exceeded 85 ſtadia (near 11 miles). On the other ſides, the mountain is leſs ſteep, but riſes very high, and is viſible all around. Upon the ſummit is a ſmall temple of Venus; and below it the ſpring Pirene, which does not overflow, but is always full of pellucid and potable water. They ſay it unites with ſome other hidden veins, and forms the ſpring at the mountain foot, running into the city, and affording a ſufficient ſupply for the uſe of the inhabitants. In the city is plenty of wells, and in the Acrocorinthus, as they ſay, for we did not ſee any. There they relate the winged horſe Pegaſus was taken as he was drinking, by Bellerophon. Below Pirene is the Siſypheum, ſome temple or palace of white ſtone, the remains not inconſiderable. From the ſummit is beheld to the north Parnaſſus and Helicon, lofty mountains covered with ſnow; and below both, to the weſt, the Criſſean gulf bounded by Phocis, by Bœotia and the Megaris, and by Corinthia and Sicyonia oppoſite to Phocis. Beyond all theſe are the mountains called the *Oneian*, ſtretching as far as Bœotia and Cithæron from the Scironian rocks on the road to Attica." Strabo ſaw likewiſe Cleon from thence. Cenchreæ was then a village. Lechæum had ſome inhabitants.

New Corinth had flouriſhed 217 years when it was viſited by Pauſanias. It had then a few antiquities, many temples and ſtatues, eſpecially about the agora or market-place, and ſeveral baths. The emperor Hadrian introduced water from a famous ſpring at Stymphalus in Arcadia; and it had various fountains alike copious and ornamental. The ſtream of one iſſued from a dolphin, on which was a brazen Neptune; of another, from the hoof of Pegaſus, on whom Bellerophon was mounted. On the right hand, coming along the road leading from the market-place toward Sicyon, was the odeum and the theatre, by which was a temple of Minerva. The old gymnaſium was at a diſtance. Going from the market-place toward Lechæum was a gate on which were placed Phæton and the Sun in gilded chariots. Pirene entered a fountain of white marble, from which the current paſſed in an open channel. They ſuppoſed the metal called *Corinthian braſs* to have been immerged while red hot in this water. On the way up to the Acrocorinthus were temples, ſtatues, and altars; and the gate next Tenea, a village with a temple of Apollo, ſixty ſtadia, or ſeven miles and a half diſtant, on the road to Mycenæ. At Lechæum was a temple and a brazen image of Neptune. At Cenchreæ were temples; and by the way from the city a grove of cypreſs trees, ſepulchres, and monuments. Oppoſite was *the Bath of Helen*, water tepid and ſalt, flowing plentifully from a rock into the ſea. Mummius had ruined the theatre of Corinth, and the munificence of the great Athenian Atticus Herodes was diſplayed in an edifice with a roof inferior to few of the moſt celebrated ſtructures in Greece.

The Roman colony was reſerved to ſuffer the ſame calamity as the Greek city, and from a conqueror more terrible than Mummius, Alaric the ſavage deſtroyer of Athens and univerſal Greece. In a country haraſſed with frequent wars, as the Peloponneſus has ſince been, the Acrocorinthus was a poſt too conſequential to be neglected. It was beſieged and taken in 1456 by Mahomet II.: the deſpots or lords of the Morea, brothers of the Greek emperor who was killed in defending Conſtantinople, refuſing payment of the arrears of the tribute, which had been impoſed by Sultan Morat in 1447. The country became ſubject to the Turks, except ſuch maritime places as were in the poſſeſſion of the Venetians; and many of the principal inhabitants were carried away to Conſtantinople. Corinth, with the Morea, was yielded to the republic at the concluſion of the war in 1698, and again by it to the Turks in 1715.

Corinth retains its old name, and is of conſiderable extent, ſtanding on a high ground, beneath the Acrocorinthus, with an eaſy deſcent toward the gulf of Lepanto; the houſes ſcattered or in parcels, except in the bazar or market-place. Cypreſſes, among which tower the domes of moſques, with corn-fields, and gardens of lemon and orange trees, are interſperſed. The air is reputed bad in ſummer, and in autumn exceedingly unhealthy. Wheler relates, that from the top of the Acrocorinthus or citadel, he enjoyed one of the moſt agreeable proſpects which this world can afford. He gueſſed the walls to be about two miles in compaſs, incloſing moſques, with houſes and churches moſtly in ruins. An hour was conſumed in going up on horſeback. It was a mile to the foot of the hill; and from hence the way was very ſteep with many traverſes. The families living below were much infeſted by corſairs, and on every alarm flocked up to the caſtle.

According to Dr Chandler, Corinth has preſerved but few monuments of its Greek or Roman citizens. The chief remains, he informs us, are at the ſouth-weſt corner of the town, and above the bazar or market; 11 columns ſupporting their architraves, of the Doric order, fluted, and wanting in height near half the common proportion to the diameter. Within them, towards the weſtern end, is one taller, though not entire, which, it is likely, contributed to ſuſtain the roof. They have been found to be ſtone, not marble; and appeared brown, perhaps from a cruſt formed on the outſide. The ruin, he judges, to be of very remote antiquity, and a portion of a fabric erected not only before the Greek city was deſtroyed, but before the Doric order had attained to maturity. He ſuſpects it to have been the Siſypheum mentioned by Strabo. North of the bazar ſtands a large maſs of brickwork, a remnant, it may be conjectured, of a bath, or of the gymnaſium.

The inhabitants are moſt of them Chriſtians of the Greek church, who are allowed liberty of conſcience by the Turks. E. Long. 28. 13. N. Lat. 38. 14.

CORINTH, *the iſthmus of*, in the Morea, is a neck of land which joins the Morea to Greece, and reaches from the gulf of Lepanto to that of Egina. Julius Cæſar, Caligula, and Nero, attempted to cut a channel throught it, but in vain; and they therefore afterwards built a wall acroſs it, which they called *Hexamilium*, becauſe it was ſix miles in length. This was demoliſhed by Amurath II. and afterwards rebuilt by the Venetians, but was levelled a ſecond time by Mahomet II.

CORINTHIAN, in general, denotes ſomething belonging to Corinth: thus we ſay, Corinthian braſs, Corinthian order, &c.

CORINTHIAN *Braſs*. See BRASS and CORINTH.

CORINTHIAN *Order*, in *Architecture*, the fourth order of architecture, according to Scamozzi; but M. Le Clerc makes it the fifth, being the moſt noble and delicate of all the five. See ARCHITECTURE, N° 47.

CORIO, BERNARDINE, an hiſtorian, born of an illuſtrious family at Milan, in the year 1460. He was ſecretary of ſtate to that duchy; and Lewis duke of Sforza appointed him to write the hiſtory of Milan. He died in 1500. The beſt edition of his hiſtory is that of 1503, in folio. It is printed in Italian, and is very ſcarce.

CORIOLANUS, C. MARCIUS, a famous Roman captain, took Corioli a town of the Volſci, whence he had his ſurname; at laſt, diſguſting the people, he was baniſhed Rome by the tribune Decius. He went to the Volſci, and perſuading them to take up arms againſt the Romans, they encamped within four miles of the city. He would not liſten to propoſals of peace till he was prevailed upon by his wife Veturia, and his mother Volumnia, who were followed by all the Roman ladies in tears. He was put to death by the Volſci as a traitor that had made them quit their conqueſt: upon which the Roman ladies went into mourning; and in the ſame place where his blood was ſpilled there was a temple conſecrated to feminine virtue.

CORIS, a genus of plants belonging to the pentandria claſs. See BOTANY *Index*.

CORIS is alſo uſed in the Eaſt Indies for a kind of ſhells which paſs for money.

CORISPERMUM, TICKSEED, a genus of plants belonging to the monandria claſs, and in the natural method ranking under the 12th order, *Holoraceæ*. See BOTANY *Index*.

CORITANI, in *Ancient Geography*, a people of Britain, occupying widely the inland parts, as Northampton, Leiceſter, Rutland, Lincoln, Nottingham, and Derbyſhires, (Camden).

CORK, the bark of a tree of the ſame name, *Quercus Suber*, Lin. See QUERCUS, BOTANY *Index*.

To take off the bark, an inciſion is made from the top to the bottom of the tree, and at each extremity another round the tree, perpendicular to the firſt. When the tree is 15 years old, it may be barked for eight years ſucceſſively; and the quality of the bark improves with the age of the tree. When ſtripped from the tree, which does not therefore die, the bark is piled up in a pond or ditch, and loaded with heavy ſtones to flatten it, and reduce it into tables: hence it is removed to be dried; and when ſufficiently dry, put in bales for carriage. If care be not taken to ſtrip the bark, it ſplits and peels of itſelf; being puſhed up by another bark formed underneath.

The cork-tree, as well as the uſes to which the bark is applied, was known both to the Greeks and Romans. Pliny informs us that the Romans employed it to ſtop all kinds of veſſels; but the uſe of it for this purpoſe does not appear to have been very common till the invention of glaſs bottles, of which, according to Profeſſor Beckman, there is no mention before the 15th century.

Other vegetable productions have been ſometimes employed inſtead of cork. The *Spondias Lutea*, a tree which grows in South America, particularly in moiſt places, and which is there called *monbin* or *monbain*, is ſometimes brought to England for the purpoſe of ſtopping veſſels. The roots of liquorice are applied to the ſame uſe, and on that account, this plant is much cultivated in Sclavonia, and exported to other countries. A tree called *nyſſa*, which grows in North America, has been found alſo to anſwer as a ſubſtitute for cork.

The chief uſe of cork is, to put in ſhoes, ſlippers, &c. and to ſtop bottles. The Spaniards burn it to make that kind of light black called *Spaniſh black*, which is uſed by painters. The Egyptians made coffins of cork; which being lined with a reſinous compoſition, preſerved dead bodies uncorrupted. The Spaniards line ſtone walls with it, which not only renders them very warm, but corrects the moiſture of the air.

Foſſil-Cork, a name given to a kind of ſtone which is a ſpecies of amianthus, conſiſting of flexible fibres looſely interwoven, and ſomewhat reſembling vegetable cork. It is the lighteſt of all ſtones; by fire it is fuſible, and forms a black glaſs. It poſſeſſes the general qualities of amianthus. See that article.

Cork, in Latin *comitatus Corcagienſis*, a county of the province of Munſter in Ireland. It is the moſt populous and conſiderable county of the kingdom next to that of Dublin, containing near a million of acres, and being divided into 15 baronies. It is bounded on the north-eaſt by the county of Waterford; on the weſt by Kerry; by Limerick on the north; and by the ſea on the ſouth and ſouth-eaſt. Including Deſmond it is 85 miles in length and 50 in breadth. but is very unequal both ways. Though a conſiderable part of the country is foggy, mountainous and barren, yet by the induſtry of the inhabitants it is pretty well cultivated and improved, and contains ſeveral good towns and harbours.

Cork, a city of Ireland, and capital of the county of that name. It is an epiſcopal ſee, and is the largeſt and moſt populous of any in the kingdom, Dublin alone excepted. It is ſituated on the river Lee, 15 miles from its mouth. It is a place of great trade, the harbour here being one of the fineſt in the world. Though ſmaller veſſels can come up to the quay, yet the larger generally ride at a place called *Paſſage*. This city, together with its liberties, makes a county. It was built or rather fortified by the Danes, in the ninth century. The greateſt part of it ſtands on a marſhy iſland ſurrounded by the river Lee, which alſo runs through the city, and divides it into ſeveral canals. On this account ſome have thought the air very moiſt and unwholeſome. Complaints have alſo been made againſt the water as impure; but, from comparing the bills of mortality with thoſe of other cities, it appears that the city of Cork is far from being unhealthy. This hath been accounted for from the influx of the tide, by which a ſtagnation of air is prevented. The firſt charter of Cork was beſtowed by Henry III. and afterwards ratified by Edward I. Edward II. and Edward III. Edward IV. granted a new charter; and the city received many favours from the ſucceeding monarchs. King James I. gave the citizens a new and ample charter; and King Charles I. what is called the Great Charter, by which, among others, a clauſe in King James's charter was enforced, making this city a county of itſelf. The ſee of Cork is reputed worth 2700l. a-year. The chapter conſiſts of a dean, chanter, chancellor, treaſurer, archdeacon, and twelve prebendaries. The church is dedicated to St Barr or Finbarr; and the dioceſe is divided into five deaneries. There is very little to be found in ancient writers concerning the foundation of the cathedral of Cork; yet it is generally aſcribed to St Barr in the ſeventh century. Many of its biſhops have been great benefactors to it. Through length of time the church became quite ruinous; but it hath lately been completely rebuilt, and is now an elegant modern ſtructure. To defray the expence, the parliament laid a tax on all coals conſumed in the city of Cork. The deanery is reputed to be worth 400l. a-year.

Cork is much improved and enlarged; ſeveral broad ſtreets have been lately added, by filling up the canals that formerly ran through them, and are now built up with elegant houſes: the parade is very ſpacious, and is adorned with an equeſtrian ſtatue of King George II. It hath the largeſt export in the kingdom, particularly of beef, hides, tallow, butter, fiſh, and other proviſions. It is partly ſituated on ſeveral iſlands, formed by the river Lee, which are banked and quayed in, ſomewhat like the towns in Holland; and partly on riſing grounds, on the north and ſouth ſides of the river. The earl of Marlborough beſieged and took it from King James's army in 1690; when the duke of Grafton, who ſerved as a volunteer, was ſlain in the attack. It contains about 8600 houſes, and upwards of 70,000 inhabitants. It hath twelve companies of foot quartered in the barracks. Beſides a ſtately cathedral, built from the foundation, between 1725 and 1735, by the produce of a duty upon coals, as above noticed, it is adorned with ſeveral handſome pariſh churches. It has alſo an elegant exchange for the merchants, a new and beautiful cuſtomhouſe, a town-hall, ſeveral fine hoſpitals, and various other public ſtructures. The city poſſeſſes an annual revenue of about 1500l. out of which the mayor enjoys for his ſalary and the ſupport of his dignity 500l. The wealth and grandeur of Cork ariſe from its capacious and commodious haven, where almoſt any number of ſhips may lie with eaſe and ſafety. According to ſome accounts, when there has been no war, 1200 veſſels have reſorted hither in a year. Ships from England, bound to all parts of the Weſt Indies, take in here a great part of their proviſions; and on the ſame account the haven of Cork is viſited by thoſe alſo of moſt other nations. The ſlaughtering ſeaſon continues from the month of Auguſt to the latter end of January; in which ſpace it has been computed, that they kill and cure ſeldom fewer than 100,000 head of black cattle. The reſt of their exports conſiſt of butter, candles, hides raw and tanned, linen cloth, pork, calves, lambs, and rabbit ſkins, tallow, wool for England, linen and woollen yarn, and worſted. The merchants of Cork carry on a very extenſive trade to almoſt all parts of the known world; ſo that their commerce is annually increaſing. The produce of the cuſtoms ſome years ſince exceeded 60,000l. and the number of ſhips that they employ is double to what it was forty years ago. The only thing that ſeemed to be wanting to the ſecurity of the port of Cork was ſupplied in the earl of Cheſterfield's memorable adminiſtration, by building a fort on the great iſland, to command the entrance of the haven. The outlets of Cork are cheerful and pleaſant. The country around the city, on both ſides of the river, is hilly and pictureſque; and the harbour called the *Cove*, is one of the beſt in the world; the entrance is ſafe, and the whole navy of England might ride in it, ſecure from every wind that blows. Ships of burden, however, are obliged to unload at Paſſage, five miles and a half from Cork, the channel not admitting veſſels of above 150 tons.

Cork Jacket or *Waiſtcoat*, is an invention of one Mr Dubourg, a gentleman very fond of ſwimming, but ſubject to the cramp, which led him to conſider of ſome method by which he might enjoy his favourite diverſion with ſafety. The waiſtcoat is compoſed of four pieces of cork, two for the breaſts and two for the back; each pretty near in length and breadth to the quarters of a waiſtcoat without flaps; the whole is covered with coarſe canvaſs, with two holes to put the arms through; there is a ſpace left between the two back-pieces, and the ſame betwixt each back and breaſt-piece, that they may fit the eaſier to the body. Thus the waiſtcoat is only open before, and may be faſtened on the wearer with ſtrings; or, if it ſhould be thought more ſecure, with buckles and leather ſtraps. This waiſtcoat does not weigh above 12 ounces, and may be made up for about five or ſix ſhillings expence. Mr Dubourg tried his waiſtcoat in the Thames, and found that it not only ſupported him on the water, but that two men could not ſink him, though they uſed their utmoſt efforts for that purpoſe. If thoſe who uſe the ſea occaſionally, and eſpecially thoſe who are obliged to be almoſt conſtantly there, were to have thoſe waiſtcoats, it would be next to impoſſible that they ſhould be drowned. It would alſo be of vaſt ſervice to thoſe that, for the ſake of health, bathe in the ſea; and even the moſt delicate and timorous young lady might by the help of one of theſe jackets venture into a rough ſea. See *Air-Jacket*, and *Bamboo-Habit*.

CORMANDEL. See Coromandel.

COR-MASS, the name of a grand proceſſion, ſaid to have been eſtabliſhed at Dunkirk during the dominion of Charles V. and renewed on St John's day, the 24th of June. After the celebration of high maſs, the proceſſion, conſiſting of the ſeveral tradeſmen of the town, begins. Each perſon has a burning taper of wax in his hand: and after each company comes a pageant, followed by the patron-ſaint, uſually of ſolid ſilver, richly wrought and adorned. The companies are followed by muſic; and after the muſicians, the friars in the habits of their order, the ſecular prieſts, and then the abbot magnificently adorned, and preceded by the hoſt. Machines likewiſe of various fantaſtical forms and devices, and as variouſly accoutred, form a part of the ſhow on this occaſion; which is deſcribed as one of the moſt ſuperb and magnificent in the world, by an eye-witneſs, in 1755.

CORMORANT, a corruption of corvorant. See Pelicanus, Ornithology *Index*.

CORN, the grain or ſeeds of plants ſeparated from the ſpica or ear, and uſed for making bread.

There are ſeveral ſpecies of corn, ſuch as wheat, rye, and barley, millet and rice, oats, maize and lentils, peaſe, and a number of other kinds; each of which has its uſefulneſs and propriety.

Europe, in every part of it; Egypt, and ſome other cantons of Africa, particularly the coaſts of Barbary; and ſome parts of America cultivated by the Europeans, particularly New England, New France, and Acadia, are the places which produce corn. Other countries have maize and rice in lieu of it; and ſome parts of America, both in the iſlands and continents, ſimple roots, ſuch as potatoes and minioc.—Egypt was anciently the moſt fertile of all other countries in corn; as appears both from ſacred and profane hiſtory. It furniſhed a good part of the people ſubject to the Roman empire, and was called the *dry nurſe of Rome and Italy*. Britain, France, and Poland, ſeem now in the place of Egypt, and with their ſuperfluities ſupport a good part of Europe.

For the firſt diſcovery and culture of corn, authors are much divided; the common opinion is, that in the firſt ages men lived on the ſpontaneous fruits of the earth; as acorns, and the nut or maſt produced by the beech; which, they ſay, took its name *fagus*, from the Greek φαγω, *I eat.* It is added that they had not either the uſe of corn, or the art of preparing or making it eatable.

Ceres has the credit of being the firſt that ſhowed the uſe of corn, on which account ſhe was placed among the gods; others gave the honour to Triptolemus; others ſhare it between the two, making Ceres the firſt diſcoverer, and Triptolemus, the firſt planter and cultivator of corn. Diodorus Siculus aſcribes the whole to Iſis; on which Polydore Virgil obſerves, he does not differ from the reſt; Iſis and Ceres being in reality the ſame. The Athenians pretend it was among them the art began; and the Cretans, or Candiots, Sicilians, and Egyptians, lay claim to the ſame. Some think the title of the Sicilians beſt ſupported, that being the country of Ceres: and authors add, ſhe did not teach the ſecret to the Athenians, till ſhe had firſt inſtructed her own countrymen. Others ſay, Ceres paſſed firſt into Attica, thence into Crete, and, laſt of all, into Sicily: many of the learned, however, maintain it was in Egypt the art of cultivating corn firſt began; and it is certain there was corn in Egypt and the Eaſt long before the time of Ceres.

Corn is very different from fruits, with reſpect to the manner of its preſervation; and is capable of being preſerved in public granaries, for preſſing occaſions, and of being kept for ſeveral centuries.—A little time after the ſiege of Metz, under Henry II. of France, in the year 1578, the duc d'Eſpernon laid up vaſt ſtores of corn in the citadel; which was preſerved in good plight to the year 1707, when the

French king and his retinue, paſſing that way, ate bread baked thereof.

The chief thing that contributes to the preſervation of corn is a cruſt which forms on its ſurface, by the germination of the grain next underneath, to the thickneſs of an inch and a half. On that at Metz people walked, without its giving the leaſt way. At Sedan was a granary cut in a rock, wherein a heap of corn was preſerved a hundred and ten years: it was covered with a cruſt a foot thick.

For the preſervation of corn, the firſt method is to let it remain in the ſpike; the only expedient for conveying it to the iſlands and provinces of America. The inhabitants of thoſe countries ſave it in the ear, and raiſe it to maturity by that precaution: but this method of preſerving it is attended with ſeveral inconveniences among us; corn is apt to rot or ſprout, if any the leaſt moiſture is in the heap; the rats likewiſe infeſt it, and our want of ſtraw alſo obliges us to ſeparate the grain from the ear. The ſecond is to turn out and winnow it frequently; or to pour it through a trough or mill-hopper, from one floor to another; being thus moved and aired every 15 days, for the firſt 6 months, it will require leſs labour for the future, if lodged in a dry place: but if, through neglect, mites ſhould be allowed to ſlide into the heap, they will ſoon reduce the corn to a heap of duſt: this muſt be avoided by moving the corn anew, and rubbing the places adjacent with oils and herbs, whoſe ſtrong odour may chace them away; for which garlic and dwarf-elder are very effectual; they may likewiſe be expoſed to the open ſun, which immediately kills them. When the corn has been preſerved from all impurities for the ſpace of two years, and has exhaled all its fires, it may be kept for 50 or even 100 years, by lodging it in pits covered with ſtrong planks cloſely joined together; but the ſafer way is to cover the heap with quicklime, which ſhould be diſſolved by ſprinkling it over with a ſmall quantity of water; this cauſes the grains to ſhoot to the depth of two or three fingers; and incloſes them with an incruſtation, as above mentioned, through which neither air nor inſects can penetrate.

Indian Corn, or *Maize*. See Zea, Botany *Index*.

Corn-Butterfly, method of deſtroying it. See Agriculture *Index*.

Corn-Crake. See Rallus, Ornithology *Index*.

Corn-Mill, a water-engine for grinding of corn. See Mechanics.

Corn, in *Farriery*. See Farriery *Index*.

CORNS, in *Surgery*, hard excreſcences, conſiſting of indurations of the ſkin ariſing on the toes, and ſometimes on the ſides of the feet, where they are much expoſed to the preſſure of the ſhoes. By degrees they preſs themſelves farther down between the muſcular fibres on theſe parts, and by their irritation occaſion extreme pain. Many cures have been preſcribed, but the total removal of them is always found to be attended with great difficulty. It has been recommended to ſoften them with plaſters, and then to pull them up by the roots, to apply cauſtic, &c. but the beſt cure is to bathe them frequently in warm water, and pare away as much as poſſible of the indurated ſkin without drawing blood.

CORNAGE, an ancient tenure, the ſervice whereof was to blow a horn when any invaſion of the Scots was perceived. This tenure was very frequent in the northern counties near the Picts wall; but by ſtat. 12 Car. II. all tenures are converted into free and common ſocage.—An old rental calls cornage, *newtgeldt*, q. d. *neat-geld*. Lord Coke ſays, in old books it is called *horngeld*.

CORNARISTS, in eccleſiaſtical hiſtory, the diſciples of Theodore Cornhert, an enthuſiaſtic ſecretary of the ſtates of Holland. He wrote at the ſame time againſt the Catholics, Lutherans, and Calviniſts. He maintained that every religious communion needed reformation; but he added, that no perſon had a right to engage in accompliſhing it without a miſſion ſupported by miracles. He was alſo of opinion, that a perſon might be a good Chriſtian without being a member of any viſible church.

CORNARIUS, or Haguenbot, *John*, a celebrated German phyſician, born at Zwickow in Saxony. His preceptor made him change his name of Haguenbot to that of Cornarius, under which he is moſt known. At 20 years of age he taught grammar, and explained the Greek and Latin poets and orators to his ſcholars; and at 23 was licentiate in medicine. He found fault with moſt of the remedies provided by the apothecaries; and obſerving, that the greateſt part of the phyſicians taught their pupils only what is to be found in Avicenna, Rhaſis, and the other Arabian phyſicians, he carefully ſought for the writings of the beſt phyſicians of Greece, and employed about 15 years in tranſlating them into Latin, eſpecially the works of Hippocrates, Aetius, Eginetes, and a part of thoſe of Galen. Meanwhile he practiſed phyſic with reputation at Zwickow, Frankfort, Marpurg, Nordhauſen, and Jena, where he died of an apoplexy in 1558, aged 58. He alſo wrote ſome medicinal treatiſes; publiſhed editions of ſome poems of the ancients on medicine and botany; and tranſlated ſome of the works of the fathers, particularly thoſe of Baſil, and a part of thoſe of Epiphanius.

CORNARO, Lewis, a Venetian of noble extraction, memorable for having lived healthful and active to above 100 years of age by a rigid courſe of temperance. By the ill conduct of ſome of his relations he was deprived of the dignity of a noble Venetian; and ſeeing himſelf excluded from all employments under the republic, he ſettled at Padua. In his youth he was of a weak conſtitution; and by irregular indulgence reduced himſelf at about 40 years of age to the brink of the grave, under a complication of diſorders; at which extremity he was told that he had no other chance for his life, but by becoming ſober and temperate. Being wiſe enough to adopt this wholeſome counſel, he reduced himſelf to a regimen of which there are very few examples. He allowed himſelf no more than 12 ounces of food and 14 ounces of liquor each day; which became ſo habitual to him, that when he was above 70 years of age, the experiment of adding two ounces to each by the advice of his friends, had like to have proved fatal to him. At 83 he wrote a treatiſe which has been tranſlated into Engliſh, and often printed, entitled, "Sure and Certain Methods of attaining a Long and Healthful Life;" in which he relates his own ſtory, and extols temperance to a degree of enthuſiaſm. At length the yolk of an egg became ſufficient for a meal, and ſometimes for two, until he died with much eaſe and compoſure in 1566. The writer of the Spectator, N° 195, confirms the fact from the authority of the Venetian ambaſſador at that time, who was a deſcendant of the Cornaro family.

CORNAVII, (Ptolemy), a people of Britain beginning in the very heart of the iſland, and extending to Cheſter. Now *Warwick*, *Worceſter*, *Salop*, *Stafford*, and *Cheſhire* (Camden).

CORNEA TUNICA, in *Anatomy*, the ſecond coat of the eye; ſo called from its ſubſtance reſembling the horn of a lantern, in Latin *cornu*. See ANATOMY *Index*.

CORNEILLE, PETER, a celebrated French poet, was born at Rouen in the year 1606. He was brought up to the bar, which he attended for ſome little time; but formed with a genius too elevated for ſuch a profeſſion, and having no turn for buſineſs, he ſoon deſerted it. An affair of gallantry occaſioned his writting his firſt piece, entitled *Melite;* which had prodigious ſucceſs. Encouraged by the applauſe of the public, he wrote the Cid, and the other tragedies that have immortalized his name. In his dramatic works he diſcovers a majeſty, a ſtrength and elevation of genius, ſcarce to be found in any other of the French poets; and, like our immortal Shakeſpeare, ſeems better acquainted with nature than with the rules of critics. Corneille was received into the French academy in 1647, and died dean of that academy in 1684, aged 78. Beſides his dramatic pieces, he wrote a tranſlation, in French verſe, of the "Imitation of Jeſus Chriſt," &c. The beſt edition of his works is that of 1682, in 4 vols 12mo.

CORNEILLE, *Thomas*, brother of the former, was a member of the French academy and of that of inſcriptions. He diſcovered in his youth a great inclination to poetry; and at length publiſhed ſeveral dramatic pieces in 5 vols 12mo, ſome of which were applauded by the public, and acted with ſucceſs. He alſo wrote, 1. A tranſlation of Ovid's Metamorphoſes, and ſome of Ovid's Epiſtles; 2. Remarks on Vauglas; 3. A Dictionary of Arts, 2 vols folio; and, 4. An Univerſal Geographical and Hiſtorical Dictionary, in 3 vols folio.

CORNEILLE, *Michael*, a celebrated painter, was born as Paris in the year 1642; and was inſtructed by his father, who was himſelf a painter of great merit. Having gained a prize at the academy, young Corneille obtained a penſion from Louis XIV.; and was ſent to Rome, where that prince had founded a ſchool for young artiſts of genius. Having ſtudied there ſome time, he gave up his penſion, and applied to the antique with great care. He is ſaid to have equalled Carache in drawing, but in colouring he was deficient. Upon his return from Rome, he was choſen profeſſor in the academy of Paris; and was employed by the above prince in all the great works he was carrying on at Verſailles and Trianon, where are ſtill to be ſeen ſome noble efforts of his genius.

CORNEL-TREE. See CORNUS, BOTANY *Index*.

CORNELIA, daughter of Scipio Africanus, was the mother of Tiberius and Caius Gracchus. She was courted by a king, but ſhe preferred being the wife of a Roman citizen to that of a monarch. Her virtues have been deſervedly commended, as well as the wholeſome principles ſhe inculcated in her two ſons. When a Campanian lady made once a ſhow of her jewels at Cornelia's houſe, and entreated her to favour her with a ſight of her own, Cornelia produced her two ſons, ſaying, "Theſe are the only jewels of which I can boaſt."

CORNELIA Lex, de civitate, was enacted, in the year of Rome 670, by L. Corn. Sylla. It confirmed the Sulpician law, and required that the citizens of the eight newly elected tribes ſhould be divided among the 35 ancient tribes.—Another, *de judiciis*, in 673, by the ſame. It ordained, that the prætor ſhould always obſerve the ſame invariable method in judicial proceedings, and that the proceſs ſhould not depend upon his will.—Another *de ſumptibus*, by the ſame. It limited the expences which generally attended funerals.—Another *de religione*, by the ſame, in 677. It reſtored to the college of prieſts the privilege of chooſing the prieſts, which by the Domitian law had been lodged in the hands of the people.—Another, *de municipiis*, by the ſame; which revoked all the privileges which had been ſome time before granted to the ſeveral towns that had aſſiſted Marius and Cinna in the civil wars.—Another *de magiſtratibus*, by the ſame; which gave the power of bearing honours, and being promoted before the legal age, to thoſe who had followed the intereſt of Sylla; while the ſons and partizans of his enemies, who had been proſcribed, were deprived of the privilege of ſtanding for any office in the ſtate.—Another, *de magiſtratibus*, by the ſame, in 673. It ordained, that no perſon ſhould exerciſe the ſame office within ten years diſtance, or be inveſted with two different magiſtracies in one year.—Another, *de magiſtratibus*, by the ſame, in 673. It diveſted the tribunes of the privilege of making laws, interfering, holding aſſemblies, and receiving appeals. All ſuch as had been tribunes were incapable of holding any other office in the ſtate by that law.—Another, *de majeſtate*, by the ſame, in 670. It made it treaſon to lend an army out of a province or engage in a war without orders, to influence the ſoldiers to ſpare or ranſom a captive general of the enemy, to pardon the leaders of robbers or pirates, or for the abſence of a Roman citizen to a foreign court without previous leave. The puniſhment was *aquæ et ignis interdictio*.—Another by the ſame. It gave the power to a man accuſed of murder, either by poiſon, weapons, or falſe accuſations, and the ſetting fire to buildings, to chooſe whether the jury that tried him ſhould give their verdict *clam* or *palam*, *viva voce*, or by ballot. Another by the ſame, which made it *aquæ et ignis interdictio* to ſuch as were guilty of forgery, concealing and altering of wills, corruption, falſe accuſations, and the debaſing or counterfeiting of the public coin. All ſuch as were acceſſory to this offence were deemed as guilty as the offender.—Another, *de pecuniis repetundis;* by which a man convicted of peculation or extortion in the provinces was condemned to ſuffer the *aquæ et ignis interdictio*.—Another, by the ſame; which gave the power to ſuch as were ſent into the provinces with any government, of retaining their command and appointment without a renewal of it by the ſenate, as was before obſerved.—Another by the ſame; which ordained, that the lands of proſcribed perſons ſhould be common, eſpecially thoſe about Volaterræ and Feſulæ in Etruria, which Sylla divided among his ſoldiers.—Another by C. Cornelius tribune of the people, in 686. It ordained, that no perſon ſhould be exempted from any law according to the general cuſtom, unleſs 200 ſenators were preſent in the ſenate; and no perſon thus exempted could hinder the bill of his exemption from being carried to the people for their concurrence.—Another, by Naſſica, in 582, to make war againſt Perſeus, ſon of Philip king of Macedon, if he did not give proper ſatisfaction to the Roman people.

CORNELIAN. See CARNELIAN.

CORNER, in a general ſenſe, the ſame with ANGLE.

CORNET, in the military art of the ancients, an inſtrument much in the nature of a trumpet; which when it only ſounded, the enſigns were to march alone without the ſoldiers; whereas when the trumpet only ſounded, the ſoldiers were to move without the enſigns. The cornets and buccinæ ſounded the charge and retreat; and the cornets and trumpets ſounded during the courſe of the battle. See Plate CLXIV.

CORNET, in modern military economy, denotes an officer in the cavalry who bears the enſign or colours of a troop.

The cornet is the third officer in the company, and commands in the abſence of the captain and lieutenant. He takes his title from his enſign, which is ſquare; and is ſuppoſed to be called by that name from *cornu*, becauſe placed on the wings, which form a kind of points or horns of the army. Others derive the name from *coronet;* alleging, that it was the ancient cuſtom for theſe officers to wear coronets or garlands on their heads.

CORNEUS, the name by which Linnæus calls a kind of tin ore, found in black columns, with irregular ſides, and terminating in priſms.

CORNICHE, CORNISH, or CORNICE, in *Architecture*, the uppermoſt member of the entablature of a column, as that which crowns the order. See ARCHITECTURE, Chap. I. and the Plates.

CORNICHE, is alſo uſed, in general, for all little projectures in maſonry or joinery, even where there are no columns, as the corniche of a chimney, beaufet, &c.

CORNICHE Ring, in a piece of ordnance, is that next from the muzzle-ring, backward.

CORNICULARIUS, in antiquity, an officer in the Roman army, whoſe buſineſs was to aid and aſſiſt the military tribune in quality of a lieutenant.

The *cornicularii* went the rounds in lieu of the tribune, viſited the watch, and were nearly what the aids major are in the French army.

The denomination *cornicularius* was given them from a little horn, called *corniculum*, which they uſed in giving orders to the ſoldiers: though Salmaſius derives it from *corniculum*, the creſt of a head-piece; it being an obſervation of Pliny, that they wore iron or braſs horns on their helmets; and that theſe were called *cornicula*.

In the *Notitia Imperii* we find a kind of ſecretary or regiſter of the ſame name. His buſineſs was to attend the judge, and enter down his ſentiments and deciſions. The critics derive the word, in this ſenſe, from *corniculum*, a little horn to put ink in.

CORNICULUM, in *Ancient Geography*, a town of the Sabines, to the eaſt of Cruſtumerium, towards the Anio. It was burnt down by Tarquin; but reſtored again, after the expulſion of the kings, (Florus). Now in ruins, called *il Monte Genaro*, (Holſtenius).

CORNISH DIAMOND, a name given by many people to the cryſtals found in digging the mines of tin in Cornwall. See CORNWALL.

CORNIX, the trivial name of a ſpecies of CORVUS. See CORVUS, ORNITHOLOGY *Index*.

CORNU. See HORN.

CORNU Ammonis, in *Natural Hiſtory*, foſſil ſhells, called alſo *ſerpent-ſtones*, or *ſnake-ſtones*.

They are found of all ſizes, from the breadth of a ſixpence to more than two feet in diameter, and ſome even larger; ſome of them rounded, others greatly compreſſed, and lodged in different ſtrata of ſtones and clays; ſome again are ſmooth, and others variouſly ridged, their ſtriæ and ridges being either ſtraight, irregularly crooked, or undulated. See *SNAKE-Stones*.

CORNU Cervi. See HARTSHORN.

CORNUCOPIA, among the ancient poets, a horn out of which proceeded plenty of all things; by a particular privilege which Jupiter granted his nurſe, ſuppoſed to be the goat Amalthea. The fable is thus interpreted: That in Libya there is a little territory ſhaped not unlike a bullock's horn, exceeding fertile, given by King Ammon to his daughter, Amalthea, whom the poets feign to have been Jupiter's nurſe.

In *Architecture* and *Sculpture* the cornucopia, or horn of plenty, is repreſented under the figure of a large horn, out of which iſſue fruits, flowers, &c. On medals, F. Joubert obſerves, the cornucopia is given to all deities.

CORNUCOPIÆ, in *Botany*, a genus of plants belonging to the triandria claſs; and in the natural method ranking under the 4th order, *Gramineæ*. See BOTANY *Index*.

CORNUS, CORNEL-TREE, CORNELIAN CHERRY, or DOG-WOOD; a genus of plants belonging to the tetrandria claſs; and in the natural method ranking under the 47th order, *Stellatæ*.

CORNUTIA, a genus of plants, belonging to the didynamia claſs, and in the natural method ranking under the 40th order, *Perſonatæ*. See BOTANY *Index*.

CORNWALL, the moſt weſterly county of England, bounded by the Engliſh channel on the ſouth, St George's channel on the weſt, the Briſtol channel on the north, and on the eaſt by the river Tamar, which ſeparates it from Devonſhire. Its name is ſuppoſed by ſome to be compounded of *carn*, ſignifying "a rock" in the Britiſh language, and *Gauls* or *Waules*, the name the Saxons gave to the Britons. Others, however, think it is derived from the Latin *cornu*, or the Britiſh *kern*, "a horn;" on account of its running out into the ſea ſomewhat in the form of a horn. Hither the ancient Britons (as well as in Wales) retired on the intruſion of the Saxons, where they oppoſed their further conqueſts. In this part of the iſland they formed a kingdom that exiſted for many years after under different princes, amongſt whom were Ambroſius Aurelius, and the juſtly celebrated Arthur; nor were they ſubdued till the middle of the 7th century, from which time Cornwall was conſidered as ſubject to the Weſt Saxon kings, who began their ſovereignty in 519, and continued it till 828, under 18 ſovereigns, the laſt of whom was the great Egbert, who ſubdued all the others; and by uniting them, formed the kingdom of England, when this country was included in the county of Devon, then the 9th diviſion; and that accounts for Alfred's not mentioning Cornwall, which, on forming the circuits after the Norman conqueſt, is included in the weſtern circuit. In 1337, Edward III. erected it into a dukedom, and inveſted with it *Edward the Black Prince*. But this, according to the expreſs words of the grant, is limited to the firſt born ſon and heir, on which account Richard II. was created duke of Cornwall by charter. So was Henry V. by his father Henry IV. Henry VI. delivered the duchy to his ſon Prince Edward, and Edward IV. created his ſon Edward V. duke of Cornwall, as did Henry VII. his ſon, afterwards Henry VIII. upon the death of his elder brother Arthur. James I. created his ſon Henry duke of Cornwall, which title on his deceaſe came to his brother Charles. The eldeſt ſons of ſucceeding kings have enjoyed this title by inheritance. Theſe not only appoint the ſheriff, but all writs, deeds, &c. are in their name, and not in the king's; and they have alſo peculiar royalties and prerogatives diſtinct from the crown, for which they appoint the officers. This county is 80 miles long, 40 broad, and 250 in circumference; containing 960,000 acres, and 126,000 inhabitants. It is divided into 9 hundreds; has 27 market towns, viz. Launceſton, Truro, Falmouth, Helſton, Saltaſh, Bodmyn, St Ives, Tregony, Camelford, Fowey, St Germains, Penryn, Callington, St Auſtle, Eaſt Looe, Padſtow, St Colomb, Penſance, Grampond, Leſkard, Leſtwithiel, St Mawes, St Michael, Newport, Market Jew, Stratton, and Redruth; 1230 villages, 191 pariſhes, 89 vicarages: provides 640 men to the militia, and pays 8 parts of the land-tax. Its chief rivers are the Tamar, Fale, Cober, Looe, Camel, Fowe, Haile, Lemara, Kenſe, and Aire. Its principal capes or headlands are the Land's-end, the Lizard, Cape Cornwall, Deadman's-head, Rame-head, &c. and a cluſter of iſlands, 144 in number, called the *Scilly iſles*, ſuppoſed formerly to have been joined to the main land, though now 30 miles diſtant; abounding with antiquities, particularly druidical.

As Cornwall is ſurrounded by the ſea on all ſides except the eaſt, its climate is ſomewhat different from that of the other parts of Britain. The reaſons of this difference will be eaſily underſtood from what is obſerved concerning the climate of America. The ſummers in Cornwall are leſs hot, and the winters leſs cold, than in other parts of England, and the ſpring and harveſt are obſerved to be more backward. High and ſudden winds are alſo more common in this than in other counties of England. The county is rocky and mountainous; but the mountains are rich in metals, eſpecially tin and copper. The valleys are very pleaſant and fertile, yielding great plenty both of corn and paſture. The lands near the ſea-coaſt are manured and fertilized with ſea-weed, and a kind of ſand formed by the particles of broken ſhells as they are daſhed againſt each other by the ſea. Cattle of all ſorts are ſmaller here than in the other counties of England; and the wool of the ſheep, which are moſtly without horns, is very fine, and the fleſh, both of them and the black cattle, extremely delicate. The county is well ſupplied with fiſh from the ſea and the many rivers with which it is watered. The moſt noted of the ſea-fiſh is the pilchard; of which prodigious quantities are caught from July to November, and exported to different parts, eſpecially to Spain. It is ſaid that a million have been ſometimes taken at a ſingle draught. The natives are remarkable for their ſtrength and activity, as well as their dexterity in wreſtling, in which exerciſe the Corniſh hug is highly extolled.

This county abounds in mines of different metals and ſemimetals; but the principal produce is tin. The Phenicians early viſited theſe coaſts for this article, ſome think 400 or 450 years before Chriſt; and the mines continued to be wrought with various ſucceſs at different periods. In the time of King John they appear to have yielded no great emolument; the right of working them being wholly in the king as earl of Cornwall, and the mines farmed by the Jews for 100 merks; and according to this proportion the 10th of it, 6l. 13s. 4d. is at this day paid by the crown to the biſhop of Exeter. In the time of Richard king of the Romans and earl of Cornwall, the tin-mines were immenſely rich; the Jews being farmed out to him by his brother Henry III. what intereſt they had was at his diſpoſal. The Spaniſh tin-mines being ſtopped by the Moors, and none diſcovered in Germany, the Malabar coaſt, or the Spaniſh Weſt Indies, Cornwall and its earls had all the trade of Europe for it. The Jews being baniſhed the kingdom, 18 Edw. I. they were again neglected till the gentlemen of Blackmore, lords of ſeven tithings beſt ſtored at that time with tin, obtained of Edmund earl of Cornwall, ſon of Richard king of the Romans, a charter under his own ſeal, with more explicit grants of privileges, courts, pleas, parliaments, and the toll-tin or $\frac{1}{15}$th of all the tin raiſed. At this time too the right of bounding or dividing tin-grounds into ſeparate partitions for the encouragement of ſearching for it ſeems to have been firſt appointed, or at leaſt adjuſted. This charter was confirmed 33 Edward I. and the Corniſh ſeparated from the Devonſhire tinners. Their laws, particularly recited in Plowden's Commentaries, p. 237, were further explained 50 Edw. III. confirmed and enlarged by parliament, 8 Rich. II. 3 Ed. IV. 1 Ed. VI. 1 and 2 P. and M. and 2 Eliz. and the whole ſociety divided into four parts under one general warden to do juſtice in law and equity, from whoſe ſentence lies an appeal to the duke of Cornwall in council, or for want of a duke of Cornwall to the crown. The lord-warden appoints a vice-warden to determine all ſtannery diſputes every month; he alſo conſtitutes four ſtewards, one for each of the precincts before mentioned, who hold their courts every three weeks, and decide by juries of ſix perſons, with an appeal reſerved to the vice-warden, lord warden, and lord of the prince's council. In difficult caſes the lord-warden, by commiſſion, iſſues his precept to the four principal towns of the ſtannery diſtricts, who each chooſe ſix members; and theſe twenty-four ſtannators conſtitute the parliament of tinners. Each ſtannator chooſes an aſſiſtant, making a kind of ſtanding council in a different apartment to give information to the prince. Whatever is enacted by the body of tinners muſt be ſigned by the ſtannators, the lord-warden, or his deputy, and by the duke or the king, and thenceforward has with regard to tin affairs all the authority of an act of the whole legiſlature. Five towns are appointed in the moſt convenient parts of the county for the tinners to bring their tin to every quarter of a year. Theſe are Leſkard, Leſtwithiel, Truro, Helſton, and Penſance, the laſt added by Charles II. for the conveniency of the weſtern tinners. In the time of Henry VIII. there were but two coinages at Midſummer and Michaelmas; two more at Chriſtmas and Lady-day were added, for which the tinners pay an acknowledgment called *Poſt groats*, or 4d. for every hundred of white tin then coined. The officers appointed by the duke aſſay it; and if well purified ſtamp it by a hammer with the duchy ſeal, the arms of Richard earl of Cornwall, a lion rampant G. crowned O. within a bordure of bezants S; and this is a permiſſion to the coiner to ſell, and is called *coining the tin*. Every hundred of white tin ſo coined pays to the duke 4s. The tin of the whole county, which, in Carew's time, in the laſt century, amounted to 30,000l. or 40,000l yearly, has for 24 years laſt paſt amounted one year with another to 180,000l. or 190,000l. ſterling. Of this the duke of Cornwall receives for his 4s. duty on every hundred of white tin above 10,000l. yearly: the bounders or proprietors of the ſoil about ⅛th at a medium clear, or about 30,000l. yearly; the remainder goes to the adventurers in the mine, who are at all the charge of working. Tin is found collected and fixed in lodes and floors, or in grains and bunches in the natural rock, or looſe and detached in ſingle ſeparate ſtones called *ſhodes* or *ſtreams*, or in a continued courſe of ſuch ſtones called the *beuheyl* or *living ſtream*, or in an arenaceous pulverized ſtate. It is moſt eaſily diſcovered by tracing the lodes by the ſcattered fragments of them called *ſhodes*, by leave of the lord of the ſoil or the bounder. The tin being divided among the lords and adventurers, is ſtamped and worked at the mill; and being thus dreſſed is carried under the name of *black tin* to the melting-houſe, where it is melted by Welſh pit-coal, and poured into blocks of 320lb. weight, and carried to the coinage town. Mundic, a ſcarce metal or mineral ore, of a white, braſſy, or brown colour, is found in large quantities, intermixed with tin, copper, and lead, and ſometimes by itſelf. Iron ore is found in Cornwall. but the working it does not anſwer. There is no richer copper, nor a greater variety, any where than in this county. Silver, if really found here in the reigns of Edward I. and II. has been rarely found ſince, nor do the lead mines anſwer. Very late diſcoveries have proved that Cornwall has more gold than was formerly imagined. What is called the *Corniſh diamond* is a figured cryſtal generally hexagonal and pyramidical, or columnar, or both, of a fine clear water, and of all our baſtard diamonds in this nation eſteemed the beſt, and ſome of different colours, black, yellow, &c. The clearer theſe are, the better they will bear engraving for ſeals.

In privileges and language Cornwall ſeems to be another kingdom. By 21 Elizabeth it was ordered that all duty on Corniſh cloth exported ſhould be remitted to every Engliſhman within the duchy of Cornwall. This was firſt granted by the Black Prince, in conſideration of their paying 4s. for the coinage of every hundred of tin; whereas Devonſhire pays no more than 8d. They have alſo by grant from Richard earl of Cornwall, confirmed 25 Henry III. freedom to take ſand out of the ſea and carry it through the country for manure; whereupon in the following reign, on an inquiſition made, we find a complaint that Saltaſh had lately taken 12s. yearly for each barge that carried ſand up the Tamar; whereas nothing ought to have been demanded. They ſtill continue this ancient method of improving their land, carrying it ten miles up into the country, and great part of the way on horſes backs. Mr Ray ſuppoſes the virtue of this ſand depends chiefly on the ſalt mixed with it, which is ſo copious that in many places ſalt is boiled up out of a lixivium made of the ſea ſand; and the reaſon why ſand when it has lain long in the ſun and wind proves leſs enriching and uſeful is, that the dews and rain evaporate great part of its ſalt. They had likewiſe a privilege of trading to all parts of the world, granted them by Charles I. in recompenſe of their loyalty.

The number of boroughs in this ſmall county was ſurpriſingly increaſed by Edward VI. who added ſeven to the original ſix, Mary two, Elizabeth ſix, making in all 21, ſending 40 members beſides the county two. Eight of theſe boroughs had an immediate or remote connection with the demeſne lands of the duchy; the reſt belonged to religious houſes, or powerful families, or were old boroughs, which had legal immunities granted to them by their princes or lords.

The Corniſh language is a dialect of that which till the Saxons came in was common to all Britain, and more anciently to Ireland and Gaul; but the inhabitants of this iſland being diſperſed before thoſe conqueſts, and driven into Wales and Cornwall, and thence into Bretagne, the ſame language, for want of frequent intercourſe, became differently pronounced and written, and in different degrees mixed with different languages. Hence came the Welſh, the Corniſh and the Armoric dialects, whoſe radicals are ſo much alike that they are known and admitted by the inhabitants of either country; but the grammar ſo varied that they cannot converſe. The Corniſh is reckoned the moſt pleaſing of the three. It was ſpoken ſo generally here down to the reign of Henry VIII. that Dr John Moreman, vicar of Mynhinet, is ſaid to have been the firſt who taught his pariſhioners the Lord's prayer, the creed, and ten commandments in Engliſh, and at the Reformation the natives deſired the ſervice in Engliſh. The older people in ſome pariſhes retained their original language to the middle of the laſt century: and the laſt ſermon was preached in it in 1678. When Mr Ray was here, 1662, he could find but one perſon who could write this language; and it is now ſo nearly extinct, that Mr Barrington, in 1768, could only find one old woman who could ſcold in it, and ſhe is ſince dead.

CORODY. See REVENUE.

COROLLA, among botaniſts, the moſt conſpicuous part of a flower, ſurrounding the organs of generation, and compoſed of one or more flower-leaves, moſt commonly called *petals*, to diſtinguiſh them from the leaves of the plant; according as there is one, two, or three of theſe petals, the corolla is ſaid to be monopetalous, dipetalous, tripetalous, &c.

COROLLARY is a conſequence drawn from ſomething already advanced or demonſtrated: thus, it being demonſtrated that a triangle which has two equal ſides, has alſo two angles equal; this corollary will follow that a triangle which has three ſides equal, has alſo its three angles equal.

COROLISTÆ, a name by which Linnæus diſtinguiſhes thoſe ſyſtematic botaniſts who have arranged vegetables from the regularity, figure, number, and other circumſtances, of the petals, or beautiful coloured leaves of the flowers. The beſt ſyſtems of this kind are thoſe of Rivinus and Tournefort. The former proceeds upon the regularity and number of the petals; the latter, with much more certainty, on their regularity and figure.

COROLLULA, a term uſed by botaniſts to expreſs the little partial flowers which make up the compound ones.

COROMANDEL, the eaſtern coaſt of the peninſula on this ſide the Ganges in Aſia. It is bounded on the north by Golconda, on the eaſt by the bay of Bengal, on the ſouth by Madura, and on the weſt by Biſnagar. This coaſt ſo much reſembles that of Orixa, that the Abbé Raynal chooſes to conſider them as one, and gives to both the general name of *Coromandel*. Here an exceſſive heat reigns from the beginning of May to the end of October. It begins at nine in the morning, and continues till nine in the evening. During the night it is allayed by a ſea-breeze from the ſouth-eaſt; and moſt commonly this refreſhing gale begins at three in the afternoon. The air is leſs inflamed during the reſt of the year, though in all ſeaſons it is very hot. It rains almoſt continually during the months of November and December. This immenſe tract is covered with a parched ſand for the extent of two miles, and ſometimes only one mile along the coaſt.

This country was at firſt neglected by the Europeans for many reaſons. It was ſeparated by inacceſſible mountains from Malabar, where theſe bold adventurers endeavoured to ſettle themſelves. Spices and aromatics, which were the principal objects of their attention, were not to be found there. In ſhort, civil diſſenſions had baniſhed from it tranquillity, ſecurity, and induſtry. At that period the empire of Biſnagar, to which this vaſt country was ſubject, was falling to ruin. The governors of Viſapour, the Carnatic, Golconda, and Orixa, threw off their dependence, and aſſumed the title of kings. Thoſe of Madura, Tanjore, Myſore, Gingi, and ſome others, likewiſe uſurped the ſovereign authority, though they retained their ancient title of *Naick*. This revolution had juſt happened when the Europeans appeared on the coaſt of Coromandel. The foreign trade was at that time inconſiderable; it conſiſted only of diamonds from Golconda, which were carried to Calicut and Surat, and from thence to Ormus or Suez, whence they were circulated through all Europe and Aſia. Maſſulipatan, the richeſt and moſt populous city of theſe countries, was the only market that was known for linens; they were purchaſed at a great fair annually holden there by the Arabian and Malayan veſſels that frequented that bay, and by caravans arrived from diſtant parts. The linens were exported to the ſame places with the diamonds. The fondneſs for the manufactures of Coromandel, which began to prevail here, inſpired all the European nations trading to the Indian ſeas with the reſolution of forming ſettlements there. They were not diſcouraged either by the difficulty of conveying goods from the inland parts of the country, where there was no navigable river; by the total want of harbours, where the ſea at one ſeaſon of the year is not navigable; by the barrenneſs of the coaſts, for the moſt part uncultivated and uninhabited; nor by the tyranny and fluctuating ſtate of the government. They thought that ſilver would be induſtriouſly ſought after; that Pegu would furniſh timber for building, and Bengal corn for ſubſiſtence; that a proſperous voyage of nine months would be more than ſufficient to complete their ladings; and that by fortifying themſelves they ſhould be ſecure againſt the attacks of the weak tyrants that oppreſſed theſe countries.

The firſt European colonies were eſtabliſhed near the ſhore. Some of them obtained a ſettlement by force; moſt of them were formed with the conſent of the ſovereigns; and all were confined to a very narrow tract of land. The boundaries of each were marked out by a hedge of thorny plants, which was their only defence. In proceſs of time fortifications were raiſed; and the ſecurity derived from them, added to the lenity of the government, ſoon increaſed the number of coloniſts. The ſplendor and independence of theſe ſettlements ſeveral times raiſed the jealouſy of the princes in whoſe dominions they were formed; but their attempts to demoliſh them proved abortive. Each colony increaſed in proſperity in proportion to the riches and the wiſdom of the nation that founded it. None of the companies that exerciſed an excluſive privilege beyond the Cape of Good Hope had any concern in the trade of diamonds. This was always left to private merchants, and by degrees fell entirely into the hands of the Engliſh, or the Jews and Armenians that lived under their protection. At preſent this grand object of luxury and induſtry is much reduced. The revolutions that have happened in Indoſtan have prevented people from reſorting to theſe rich mines; and the anarchy in which this unhappy country is plunged leaves no room to hope that they will be again attended to. The whole of the commercial operations on the coaſt of Coromandel is confined to the purchaſe of cottons. The manufacturing of the white cotton brought there differs ſo little from ours, that it would be neither intereſting nor inſtructive to enter into a minute deſcription of it. The proceſs uſed in making their printed cottons, which was at firſt ſervilely followed in Europe, has ſince been rendered more ſimple, and brought to greater perfection by our manufacturers. The painted cottons which are brought thither we have not yet attempted to imitate. Thoſe who imagine we have been prevented from undertaking this branch merely by the high price of labour among us, are miſtaken. Nature has not given us the wild fruits and drugs neceſſary for the compoſition of thoſe bright and indelible colours which conſtitute the principal merit of the Indian manufactures; nor has ſhe furniſhed us with the waters that ſerve to fix them. The Indians do not univerſally obſerve the ſame method in painting their cottons; either becauſe there are ſome niceties peculiar to certain provinces, or becauſe different ſoils produce different drugs for different uſes. We ſhould tire the patience of our readers were we to trace the

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ſlow and painful progreſs of the Indians in the art of painting their cottons. It is natural to believe that they owe it to length of time, rather than to the fertility of their genius. What ſeems to authoriſe this conjecture is, that they have ſtopped in their improvements, and have not advanced a ſingle ſtep in the arts for many ages; whereas we have proceeded with amazing rapidity. Indeed, were we to conſider only the want of invention in the Indians, we ſhould be tempted to believe, that, from time immemorial, they have received the arts they cultivate from ſome more induſtrious nation; but when it is remembered that theſe arts have a peculiar dependence on the materials, gums, colours, and productions of India, we cannot but be convinced that they are natives of that country. It may appear ſomewhat ſurpriſing that cottons painted with all ſorts of colours ſhould be ſold at ſo moderate a price, that they are almoſt as cheap as thoſe that have only two or three. But it muſt be obſerved, that the merchants of the country ſell to all the companies a large quantity of cottons at a time; and that the demand for cottons painted with various colours makes but a ſmall article in their aſſortments, as they are not much eſteemed in Europe.

Though cottons of all ſorts are in ſome degree manufactured through the whole country of Indoſtan, which extends from Cape Comorin to the banks of the Ganges; it is obſervable, that the fineſt are made in the eaſtern part, the common ones in the centre, and the coarſe ones in the moſt weſtern parts. Manufactures are eſtabliſhed in the European colonies, and upon the coaſt: they are more frequent at the diſtance of five or ſix leagues from the ſea, where cotton is more cultivated, and proviſions are cheaper. The purchaſes made there are carried 30 or 40 leagues farther into the country. The Indian merchants ſettled in the European factories have always the management of this buſineſs. The quantity and quality of the goods wanted are ſettled with theſe people: the price is fixed according to the patterns: and at the time a contract is made, a third or fourth part of the money agreed on is advanced. This arrangement is owing to the neceſſity theſe merchants themſelves are under of advancing money to the workmen by the partners or agents who are diſperſed through the whole country; of keeping a watchful eye upon them, for fear of loſing what they have advanced; and of gradually leſſening the ſum, by calling for the cottons as faſt as they are worked off. Without theſe precautions, nothing could be depended on in an oppreſſive government, where the weaver cannot work on his own account, either becauſe his circumſtances will not permit, or becauſe he dares not venture to diſcover them for fear of exactions. The companies that have either ſucceſs or good management, conſtantly keep the ſtock of one year in advance in their ſettlements. By this method they are ſure of having the quantity of goods they have occaſion for, and of the quality they chooſe, at the moſt convenient time: not to mention that their workmen, and their merchants, who are kept in conſtant employment, never leave them. Such nations as want money and credit cannot begin their mercantile operations till the arrival of their ſhips. They have only five or ſix months at moſt to execute the orders ſent from Europe. The goods are manufactured and examined in haſte; and they are even obliged to take ſuch as are known to be bad, and would be rejected at any other time. The neceſſity they are under of completing their cargoes, and fitting out their veſſels before hurricanes come on, leaves no room for nicety of inſpection. It would be a miſtake to imagine that the country agents could be prevailed upon to order goods to be made on their account in hopes of ſelling them with a reaſonable advantage to the company with whom they are engaged. For, beſides that the generality of them are not rich enough to embark in ſo large an undertaking, they would not be certain of finding their account in it. If the company that employ them ſhould be hindered by unforeſeen accidents from ſending the uſual number of ſhips, theſe merchants would have no vent for their commodities. The Indians, the form of whoſe dreſs requires different breadths and lengths from thoſe of the cottons fabricated for our uſe, would not purchaſe them; and the other European companies would be provided, or certain of being provided, with whatever the extent of their trade required, and their money enabled them to purchaſe. The plan of procuring loans, which was contrived to remedy this inconvenience, never has nor can be uſeful. It has been a cuſtom, time immemorial, in Indoſtan, for every citizen who borrows money to give a written inſtrument to his creditor. This deed is of no force in a court of judicature, unleſs it is ſigned by three witneſſes, and bears the day of the month and the year when it was made, with the rate of intereſt agreed upon by the parties. If the borrower fails to fulfil his engagements, he may be arreſted by the lender himſelf. He is never impriſoned, becauſe there is no fear of his making his eſcape. He would not even eat, without obtaining leave of his creditor. The Indians make a three-fold diviſion of intereſt: one kind they call *vice;* another neither *vice* nor *virtue;* and a third, they ſay, is *virtue.* The firſt is four per cent. a month; the ſecond two; and the third one. The laſt is, in their opinion, an act of beneficence that only belongs to the moſt heroic minds. Yet, though the Europeans, who are forced to borrow, meet with this treatment, it is plain they cannot avail themſelves of the indulgence without being involved in ruin.

The foreign trade of Coromandel is not in the hands of the natives. In the weſtern part, indeed, there are Mohammedans known by the name of *Chalias*, who, at Naour and Porto-Nuovo, ſend out ſhips to Acheen, Merguy, Siam, and the eaſtern coaſt. Beſides veſſels of conſiderable burden employed in theſe voyages, they have ſmaller embarkations for the coaſting trade for Ceylon and the pearl fiſhery. The Indians of Maſſulipatan turn their attention another way. They import from Bengal white callicoes, which they dye or print, and ſell them again at the places from whence they had them, at 35 or 40 per cent. advantage. Excepting theſe tranſactions, which are of very little conſequence, the whole trade is veſted in the Europeans, who have no partners but a few Banians and Armenians ſettled in their colonies. The quantity of callicoes exported from Coromandel to the different ports of India may be computed at 3500 bales. Of theſe the French carry 800 to Malabar, Mocha, and the iſle of France; the Engliſh, 1200 to Bombay, Malabar, Sumatra, and the Philippine iſlands; and the Dutch 1500 to their different ſettlements. Except 500 bales deſtined for Manila, each of the value of 100 guineas, the others are of ſuch an ordinary kind that they do not exceed 30 guineas at prime coſt; ſo that the whole number of bales does not amount to more than about 150,000l.

Coromandel furniſhes Europe with 9500 bales; 800 of which are brought by the Danes, 2500 by the French, 3000 by the Engliſh, and 3200 by the Dutch. A conſiderable part of theſe callicoes are dyed blue, or ſtriped blue and red for the African trade. The others are fine muſlins, printed callicoes, and handkerchiefs from Maſſulipatan, or Paliacate. It is proved by experience that each of theſe bales coſts only about 42l. ſterling; conſequently they ought to bring in to the manufactory where they are wrought near 360,000l. The payments are not entirely made in ſpecie, either in Europe or Aſia; we give in exchange, cloths, iron, lead, copper, coral, and ſome other articles of leſs value. On the other hand, Aſia pays with ſpices, pepper, rice, ſugar, corn and dates. All theſe articles taken together may amount to about 210,000l.; and from this calculation it follows, that Coromandel receives annually from Europe about 300,000l. in money. The Britiſh, who have acquired the ſame ſuperiority on this coaſt that they have elſewhere, have formed on it ſeveral ſettlements.

CORONA, among anatomiſts, denotes that edge of the glans penis where the preputium begins.

CORONA, or *Halo*, in *Optics*, a luminous circle, ſurrounding the ſun, the moon, the planets, or fixed ſtars. Sometimes theſe circles are white, and ſometimes coloured like the rainbow. Sometimes one only is viſible, and ſometimes ſeveral concentric coronas make their appearance at the ſame time. Thoſe which have been ſeen about Sirius and Jupiter were never more than three, four, or five degrees in diameter; thoſe which ſurround the moon are alſo ſometimes no more than three or five degrees; but theſe, as well as thoſe which ſurround the ſun, are of very different magnitudes, viz. of 12° 0′, 22° 35′, 30° 0′, 38° 0′, 41° 2′, 45° 0′, 46° 24′, 47° 0′, and 90°, or even larger than this. Their diameters alſo ſometimes vary during the time of obſervation, and the breadths both of the coloured and white circles are very different, viz. of 2, 4, or 7 degrees.

The colours of theſe coronas are more dilute than thoſe of the rainbow; and they are in a different order, according to their ſize. In thoſe which Newton obſerved in 1692, they were in the following order, reckoned from the inſide. In the innermoſt were blue, white, and red; in the middle were purple, blue, green, yellow, and pale red; in the outermoſt, pale blue and pale red. Mr Huygens obſerved red next the ſun, and a pale blue outwards. Sometimes they are red on the inſide and white on the outſide. M. Weidler obſerved one that was yellow on the inſide and white on the outſide. In France, one was obſerved in 1683, the middle of which was white; after which followed a border of red; next to it was blue, then green, and the outermoſt circle was a bright red. In 1728, one was ſeen of a pale red outwardly, then followed yellow, and then green, terminated by a white.

Theſe coronas are very frequent. In Holland, M. Muſchenbroeck ſays, 50 may be ſeen in the day-time, almoſt every year; but they are difficult to be obſerved, except the eye be ſo ſituated, that not the body of the ſun, but only the neighbouring parts of the heavens can be ſeen. Mr Middleton ſays, that this phenomenon is very frequent in North America; for that there is generally one or two about the ſun every week, and as many about the moon every month. Halos round the ſun are very frequent in Ruſſia. M. Æpinus ſays, that from the 23d of April 1758, to the 20th of September, he himſelf had obſerved no leſs than 26, and that he has ſometimes ſeen twice as many in the ſame ſpace of time.

Coronas may be produced by placing a lighted candle in the midſt of ſteam in cold weather. Alſo, if glaſs windows be breathed upon, and the flame of a candle be placed ſome feet from it, while the ſpectator is alſo at the diſtance of ſome feet from another part of a window, the flame will be ſurrounded with a coloured halo. And if a candle be placed behind a glaſs receiver, when air is admitted into the vacuum within it, at a certain degree of denſity, the vapour with which it is loaded will make a coloured halo round the flame. This was obſerved by Otto Guericke. In December 1756, M. Muſchenbroeck obſerved, that when the glaſs windows of his room were covered with a thin plate of ice on the inſide, the moon appearing through it was ſurrounded with a large and variouſly coloured halo; and, opening the window, he found that it aroſe entirely from that thin plate of ice, for none was ſeen except through it.

Similar, in ſome reſpects, to the halo, was the remarkable appearance which M. Bouguer deſcribes, as obſerved by himſelf and his companions on the top of Mount Pinchinca, in the Cordilleras. When the ſun was juſt riſing behind them, ſo as to appear white, each of them ſaw his own ſhadow projected upon it, and no other. The diſtance was ſuch, that all the parts of the ſhadow were eaſily diſtinguiſhable, as the arms, the legs, and the head; but what ſurpriſed them moſt was, that the head was adorned with a kind of glory, conſiſting of three or four ſmall concentric crowns, of a very lively colour, each exhibiting all the varieties of the primary rainbow, and having the circle of red on the outſide. The intervals between theſe circles continued equal, though the diameters of them all were conſtantly changing. The laſt of them was very faint, and at a conſiderable diſtance was another great white circle, which ſurrounded the whole. As near as M. Bouguer could compute, the diameter of the firſt of theſe circles was about $5\frac{2}{3}$ degrees, that of the ſecond 11, that of the third 17, and ſo on: but the diameter of the white circle was about 76 degrees. This phenomenon never appeared but in a cloud conſiſting of frozen particles, and never in drops of rain like the rainbow. When the ſun was not in the horizon, only part of the white circle was viſible, as M. Bouguer frequently obſerved afterwards.

Similar alſo to this curious appearance was one that was obſerved by Dr M'Feat in Scotland. This gentleman obſerved a rainbow round his ſhadow in the miſt, when he was upon an eminence above it. In this ſituation the whole country round ſeemed, as it were, buried under a vaſt deluge, and nothing but the tops of diſtant hills appeared here and there above the flood: ſo that a man would think of diving down into it with a kind of horror. In thoſe upper regions the air, he ſays, is at that time very pure and agreeable to breathe in. At another time he obſerved a double range of colours round his ſhadow in theſe circumſtances. The colours of the outermoſt range were broad and very diſtinct, and everywhere about two feet diſtant from the ſhadow. Then there was a darkiſh interval, and after that another narrower range of colours, cloſely ſurrounding the ſhadow, which was very much contracted. This perſon ſeems to think that theſe ranges of colours are cauſed by the inflection of the rays of light, the ſame that occaſioned the ring of light which ſurrounds the ſhadows of all bodies, obſerved by M. Maraldi, and this author *. But the prodigious variety with which theſe appearances are exhibited ſeems to ſhow that many of them do not reſult from the general laws of reflection, refraction, or inflection, belonging to tranſparent ſubſtances of a large maſs; but upon the alternate reflection and tranſmiſſion of the different kinds of rays, peculiar to ſubſtances reduced to the form of thin plates, or conſiſting of ſeparate and very minute parts. But where the dimenſions of the coronas are pretty conſtant, as in the uſual and larger halo, which is about half the diameter of the rainbow, they may, perhaps, be explained on the general principles of refraction only.

Deſcartes obſerves, that the halo never appears when it rains: from which he concludes that this phenomenon is occaſioned by the refraction of light in the round particles of ice, which are then floating in the atmoſphere; and though theſe particles are flat when they fall to the ground, he thought they muſt be protuberant in the middle, before their deſcent; and according to this protuberancy he imagined that the diameter of the halo would vary.—In treating of meteors, Gaſſendi ſuppoſed that a halo is the ſame thing with the rainbow, the rays of light being in both caſes twice refracted and once reflected within each drop of rain or vapour, and that all the difference there is between them ariſes from their different ſituation with reſpect to the obſerver. For, whereas, when the ſun is behind the ſpectator, and conſequently the rainbow before him, his eye is in the centre of the circle; when he views the halo, with his face towards the ſun, his eye is in the circumference of the circle; ſo that according to the known principles of geometry, the angle under which the object appears in this caſe muſt be juſt half of what it is in the other. Though this writer ſays a great deal upon the ſubject, and endeavours to give reaſons why the colours of the halo are in a different order to thoſe of the rainbow, he does not deſcribe the progreſs of the rays of light from the ſun to the eye of the ſpectator when a halo is formed by them, and he gives no figures to explain his ideas.

Plate CLXIV.

Dechales, alſo, endeavours to ſhow that the generation of the halo is ſimilar to that of the rainbow. If, ſays he, a ſphere of glaſs or cryſtal, AB, (fig. 1.) full of water, be placed in the beams of the ſun ſhining from C, there will not only be two circles of coloured light on the ſide next the ſun, and which conſtitute the two rainbows; but there will alſo be another on the part oppoſite to the ſun, the rays belonging to which meeting at E, afterwards diverge, and form the coloured circle G, as will be viſible, if the light that is tranſmitted through the globe be received on a piece of white paper. The colours alſo will appear to an eye placed in any part of the ſurface of the cone FEG. Meaſuring the angle FEH, he found it to be 23 degrees. They were only the extreme rays of this cone that were coloured like thoſe of the rainbow.

This experiment he thought ſufficiently illuſtrated the generation of the halo; ſo that whenever the texture of the clouds is ſuch, as not entirely to intercept the rays of the ſun or moon, and yet have ſome degree of denſity, there will always be a halo round them, the colours of the rainbow appearing in thoſe drops which are 23 degrees diſtant from the ſun or moon. If the ſun be at A (fig. 2.), and the ſpectator in B, the halo will be the circle DFE, DBE, being 46 degrees, or twice 23.

The reaſon why the colours of the halo are more dilute than thoſe of the rainbow, he ſays, is owing principally to their being formed not in large drops of rain, but in very ſmall vapour; for if the drops of water were large, the cloud would be ſo thick, that the rays of the ſun could not be regularly tranſmitted through them; and, on the other hand, he had obſerved, that when the rainbow is formed by very thin vapours, the colours hardly appear. As for thoſe circles of colours which are ſometimes ſeen round candles, it was his opinion that they are owing to nothing but moiſture on the eye of the obſerver; for that he could never produce this appearance by means of vapour only, if he wiped his eyes carefully; and he had obſerved that ſuch circles are viſible to ſome perſons and not to others, and to the ſame perſons at one time and not another.

The moſt conſiderable of all the theories reſpecting halos, and that which has met with the moſt favourable and longeſt reception, is that of Mr Huygens. Sir Iſaac Newton mentions it with reſpect, and Dr Smith, in his Complete Syſtem of Optics, does not ſo much as hint at any other. The occaſion of Mr Huygens publiſhing his thoughts on this ſubject, was the appearance of a halo at Paris, on the 12th of May 1667, of which he gave an account in a paper read at the Royal Academy in that city, which was afterwards tranſlated, and publiſhed in the Engliſh Philoſophical Tranſactions, and which may be ſeen in Lowthorp's Abridgment, vol. ii. p. 189. But this article contains nothing more than the heads of a diſcourſe, which he afterwards compoſed, but never quite finiſhed, on this ſubject; and which has been tranſlated, with ſome additions, by Dr Smith, from whom the following account is chiefly extracted.

Our philoſopher had been firſt engaged to think particularly upon this ſubject, by the appearance of five ſuns at Warſaw, in 1658; preſently after which, he ſays, he hit upon the true cauſe of halos, and not long after of that of mock ſuns alſo.

To prepare the way for the following obſervations, it muſt be remarked, that if we can conceive any kind of bodies in the atmoſphere, which, according to the known laws of optics, will, either by means of reflec-

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* *Edin. Eſſays*, vol. i. p. 198.

tion or refraction, produce the appearance in queſtion, when nothing elſe can be found that will do it, we muſt acquieſce in the hypotheſis, and ſuppoſe ſuch bodies to exiſt, even though we cannot give a ſatisfactory account of their generation. Now, two ſuch bodies are aſſumed by Mr Huygens; one of them a round ball, opaque in the centre, but covered with a tranſparent ſhell; and the other is a cylinder, of a ſimilar compoſition. By the help of the former he endeavours to account for halos, and by the latter for thoſe appearances which are called mock ſuns. Thoſe bodies which Mr Huygens requires, in order to explain theſe phenomena, are not, however, a mere aſſumption; for ſome ſuch, though of a larger ſize than his purpoſe requires, have been actually found, conſiſting of ſnow within and ice without. They are particularly mentioned by Deſcartes.

The balls with the opaque kernel, which he ſuppoſed to have been the cauſe of them, he imagines not to exceed the ſize of a turnip-ſeed; but, in order to illuſtrate this hypotheſis, he gives a figure of one, of a larger ſize, in ABCDEF, (fig. 3.) repreſenting the kernel of ſnow in the middle of it. If the rays of light, coming from GH, fall upon the ſide AD, it is manifeſt they will be ſo refracted at A and D, as to bend inwards; and many of them will ſtrike upon the kernel EF. Others, however, as GA and HD, will only touch the ſides of the kernel; and being again refracted at B and C, will emerge in the lines BK, CK, croſſing each other in the point K, whoſe neareſt diſtance from the globule is ſomewhat leſs than its apparent diameter. If, therefore, BK and CK be produced towards M and L, (fig. 4.) it is evident that no light can reach the eye placed within the angle LKM, but may fall upon it when placed out of that angle, or rather the cone repreſented by it.

For the ſame reaſon, every other of theſe globules will have a ſhadow behind it, in which the light of the ſun will not be perceived. If the eye be at N, and that be conceived to be the vertex of a cone, the ſides of which NR, NQ, are parallel to the ſides of the former cone KL, KM, it is evident that none of the globules within the cone QNR can ſend any rays of the ſun to the eye at N. But any other globule out of this cone, as X, may ſend thoſe rays, which are more refracted than XZ, to the eye; ſo that this will appear enlightened, while thoſe within the cone will appear obſcure. It is evident from this, that a certain area, or ſpace, quite round the ſun, muſt appear dark; and that the ſpace next to this area will appear luminous, and more ſo in thoſe parts that are neareſt to the obſcure area; becauſe, he ſays, it may eaſily be demonſtrated, that thoſe globules which are neareſt to the cone QNR exhibit the largeſt image of the ſun. It is plain, alſo, that a corona ought to be produced in the ſame manner, whatever be the ſun's altitude, becauſe of the ſpherical figure of the globules.

To verify this hypotheſis, our philoſopher adviſes us to expoſe to the ſun a thin glaſs bubble, filled with water, and having ſome opaque ſubſtance in the centre of it; and he ſays we ſhall find, that we ſhall not be able to ſee the ſun through it, unleſs at a certain diſtance from a place oppoſite to the centre of it; but as ſoon as we do perceive the light, the image of the ſun will immediately appear the brighteſt, and coloured red, for the ſame reaſon as in the rainbow.

Theſe coronas, he ſays, often appear about the moon; but the colours are ſo weak as to appear only white. Such white coronas he had alſo ſeen about the ſun, when the ſpace within them appeared ſcarce darker than that without. This he ſuppoſes to happen when there are but few of thoſe globules in the atmoſphere; for the more plentiful they are, the more lively the colours of the halo appear; at the ſame time alſo the area within the corona will be the darker. The apparent diameter of the corona, which is generally about 45 degrees, depends upon the ſize of the dark kernel; for the larger it is with reſpect to the whole globule, the larger will be the dark cone behind it.

The globules that form theſe halos, Mr Huygens ſuppoſes to have conſiſted of ſoft ſnow, and to have been rounded by continual agitation in the air, and thawed on their outſides by the heat of the ſun.

To make the diameter of the halo 45 degrees, he demonſtrates that the ſemidiameter of the globule muſt be to the ſemidiameter of the kernel of ſnow very nearly as 1000 to 480; and that to make a corona of 100 degrees, it muſt be as 1000 to 680.

Mr Weidler, in his Commentary on parhelia, publiſhed at Wirtemberg in 1733, obſerves that it is very improbable that ſuch globules as Mr Huygens's hypotheſis requires, with nuclei of ſuch a preciſe proportion, ſhould exiſt; and if there were ſuch bodies, he thinks they would be too ſmall to produce the effects aſcribed to them. Beſides, he obſerves that appearances exactly ſimilar to halos are not uncommon, where fluid vapours alone are concerned; as when a candle is placed behind the ſteam of boiling water in froſty weather, or in the midſt of the vapour iſſuing copiouſly from a bath, or behind a receiver when the air is ſo much rarefied as to be incapable of ſupporting the water it contains. The rays of the ſun twice reflected and twice refracted within ſmall drops of water are ſufficient, he ſays, without any opaque kernel, to produce all the appearances of the halos that have the red light towards the ſun, as may be proved by experiment. That the diameter of the halos is generally half of that of the rainbow, he accounts for as Gaſſendi did before him.

M. Mariotte accounts for the formation of the ſmall coronas by the tranſmiſſion of light through aqueous vapours, where it ſuffers two refractions, without any intermediate reflection. He ſhows that light which comes to the eye, after being refracted in this manner, will be chiefly that which falls upon the drop nearly perpendicular; becauſe more rays fall upon any given quantity of ſurface in that ſituation, fewer of them are reflected with ſmall degrees of obliquity, and they are not ſo much ſcattered after refraction. The red will always be outermoſt in theſe coronas, as conſiſting of rays which ſuffer the leaſt refraction. And whereas he had ſeen, when the clouds were driven briſkly by the wind, halos round the moon, varying frequently in their diameter, being ſometimes of two, ſometimes of three, and ſometimes of four degrees; ſometimes alſo being coloured, ſometimes only white, and ſometimes diſappearing entirely; he concluded that all theſe variations aroſe from the different thickneſs of the clouds, through which ſometimes more and ſometimes leſs light was tranſmitted. He ſuppoſed, alſo, that the light which formed them might ſometimes be reflected, and at other times refracted. As to thoſe coronas which conſiſt of two orders of colours, he imagined that they were produced by ſmall pieces of ſnow, which, when they begin to diſſolve, form figures which are a little convex towards their extremities. Sometimes, alſo, the ſnow will be melted in different ſhapes; and in this caſe, the colours of ſeveral halos will be intermixed, and confuſed; and ſuch, he ſays, he had ſometimes obſerved round the ſun.

M. Mariotte then proceeds to explain the larger coronas, namely thoſe that are about 45 degrees in diameter, and for this purpoſe he has recourſe to equiangular priſms of ice, in a certain poſition with reſpect to the ſun; and he takes pains to trace the progreſs of the rays of light for this purpoſe; but this hypotheſis is very improbable. In ſome caſes he thought that theſe large coronas were cauſed by hailſtones, of a pyramidal figure; becauſe after two or three of them had been ſeen about the ſun, there fell the ſame day ſeveral ſuch pyramidal hailſtones. M. Mariotte explains parhelia by the help of the ſame ſuppoſitions. See PARHELIA.

Sir Iſaac Newton does not appear to have given any particular attention to the ſubject of halos, but he has hinted at his ſentiments concerning them occaſionally; by which we perceive that he conſidered the larger and leſs variable appearances of this kind as produced according to the common laws of refraction, but that the leſs and more variable appearances depend upon the ſame cauſe with the colours of thin plates.

He concludes his explication of the rainbow with the following obſervation on halos and parhelias. "The light which comes through drops of rain by two refractions, without any reflection, ought to appear the ſtrongeſt at the diſtance of about 20 degrees from the ſun, and to decay gradually both ways as the diſtance from him increaſes. And the ſame is to be underſtood of light tranſmitted through ſpherical hailſtones: and if the hail be a little flatted, as it often is, the tranſmitted light may be ſo ſtrong, at a little leſs diſtance than that of 26 degrees, as to form a halo about the ſun or moon; which halo, as often as the hailſtones are duly figured, may be coloured, and then it muſt be red within by the leaſt refrangible rays, and blue without by the moſt refrangible ones: eſpecially if the hailſtones have opaque globules of ſnow in their centres to intercept the light within the halo, as Mr Huygens has obſerved, and make the inſide of it more diſtinctly defined than it would otherwiſe be. For ſuch hailſtones, though ſpherical, by terminating the light by the ſnow, may make a halo red within, and colourleſs without, and darker within the red than without, as halos uſe to be. For of thoſe rays which paſs cloſe by the ſnow, the red-making ones will be the leaſt refracted, and ſo come to the eye in the ſtraighteſt lines."

Some farther thoughts of Sir Iſaac Newton on the ſubject of halos we find ſubjoined to the account of his experiments on the colours of thick plates of glaſs, which he conceived to be ſimilar to thoſe which are exhibited by thin ones. "As light reflected by a lens quickſilvered on the back ſide makes the rings of the colours above deſcribed, ſo (he ſays) it ought to make the like rings in paſſing through a drop of water. At the firſt reflection of the rays within the drop, ſome colours ought to be tranſmitted, as in the caſe of a lens, and others to be reflected back to the eye. For inſtance, if the diameter of a ſmall drop or globule of water be about the 500dth part of an inch, ſo that a red-making ray, in paſſing through the middle of this globule, has 250 fits of eaſy tranſmiſſion within the globule, and all the red-making rays which are at a certain diſtance from this middle ray round about it have 249 fits within the globule, and all the like rays at a certain further diſtance round about it have 248 fits, and all thoſe at a certain farther diſtance 247 fits, and ſo on; theſe concentric circles of rays, after their tranſmiſſion, falling on a white paper, will make concentric rings of red upon the paper, ſuppoſing the light which paſſes through one ſingle globule ſtrong enough to be ſenſible; and in like manner the rays of other colours will make rings of other colours. Suppoſe now that in a fair day the ſun ſhould ſhine through a thin cloud of ſuch globules of water or hail, and that the globules are all of the ſame ſize, the ſun ſeen through this cloud ought to appear ſurrounded with the like concentric rings of colours, and the diameter of the firſt ring of red ſhould be $7\frac{1}{4}^{\circ}$, that of the ſecond $10\frac{1}{4}^{\circ}$, that of the third $12^{\circ}\ 33'$, and according as the globules of water are bigger or leſs, the ring ſhould be leſs or bigger."

This curious theory our author informs us was confirmed by an obſervation which he made in 1692. He ſaw by reflection, in a veſſel of ſtagnating water, three halos, crowns, or rings of colours about the ſun, like three little rainbows concentric to his body. The colours of the firſt, or innermoſt crown, were blue next the ſun, red without, and white in the middle, between the blue and red. Thoſe of the ſecond crown were purple and blue within, and pale red without, and green in the middle. And thoſe of the third were pale blue within, and pale red without. Theſe crowns incloſed one another immediately, ſo that their colours proceeded in this continual order from the ſun outward; blue, white, red; purple, blue, green, pale, yellow, and red; pale blue, pale red. The diameter of the ſecond crown, meaſured from the middle of the yellow and red on one ſide of the ſun, to the middle of the ſame colour on the other ſide was $9\frac{1}{3}$ degrees or thereabouts. The diameters of the firſt and third he had not time to meaſure; but that of the firſt ſeemed to be about five or ſix degrees, and that of the third about twelve. The like crowns appear ſometimes about the moon; for in the beginning of the year 1664, on February 19th at night, he ſaw two ſuch crowns about her. The diameter of the firſt or innermoſt was about three degrees, and that of the ſecond about five degrees and a half. Next about the moon was a circle of white; and next about that the inner crown, which was of a bluiſh green within, next the white, and of a yellow and red without; and next about theſe colours were blue and green on the inſide of the outer crown, and red on the outſide, of it.

At the ſame time there appeared a halo at the diſtance

ſtance of about 22° 35′ from the centre of the moon. It was elliptical; and its long diameter was perpendicular to the horizon, verging below fartheſt from the moon. He was told, that the moon has ſometimes three or more concentric crowns of colours encompaſſing one another next about her body. The more equal the globules of water or ice are to one another, the more crowns of colours will appear, and the colours will be the more lively. The halo, at the diſtance of 22½ degrees from the moon, is of another ſort. By its being oval, and more remote from the moon below than above, he concludes that it was made by refraction in ſome kind of hail or ſnow floating in the air in an horizonal poſture, the refracting angle being about 50 or 60 degrees. Dr Smith, however, makes it ſufficiently evident, that the reaſon why this halo appeared oval, and more remote from the moon towards the horizon, is a deception of ſight, and the ſame with that which makes the moon appear larger in the horizon.

Dr Kotelnihow having, like Dr Halley, made very accurate obſervations to determine the number of poſſible rainbows, conſiders the coloured halo which appears about a candle as the ſame thing with one of theſe bows which is formed near the body of the ſun, but which is not viſible on account of his exceſſive ſplendor.

Laſtly, M. Muſchenbroeck concludes his account of coronas with obſerving, that ſome denſity of vapour, or ſome thickneſs of the plates of ice, divides the light in its tranſmiſſion through the ſmall globules of water, or their interſtices, into its ſeparate colours: but what that denſity was, or what was the ſize of the particles which compoſed the vapour, he could not pretend to determine.

CORONA, among *Botaniſts*, the name given by ſome to the circumference or margin of a radiated compound flower. It correſponds to the radius of Linnæus; and is exemplified in the flat, tongue-ſhaped petals which occupy the margin of the daiſy or ſunflower.

CORONA Auſtralis or *Meridionalis*, Southern Crown, a conſtellation of the ſouthern hemiſphere, whoſe ſtars in Ptolemy's catalogue are 13, in the Britiſh catalogue 12.

CORONA Borealis, the Northern Crown or Garland, in *Aſtronomy*, a conſtellation of the northern hemiſphere, whoſe ſtars in Ptolemy's catalogue are eight, in Tycho's as many, and in Mr Flamſtead's 21.

CORONA Imperialis, in *Conchology* a name given by ſome authors to a kind of voluta, differing from the other ſhells of that family, by having its head ornamented with a number of points, forming a ſort of crown. See VOLUTA, CONCHOLOGY *Index*.

CORONALE, in *Anatomy*, the firſt ſuture of the ſkull. See ANATOMY *Index*.

CORONALE os, the ſame with os frontis. See ANATOMY *Index*.

CORONARY VESSELS, in *Anatomy*, certain veſſels which furniſh the ſubſtance of the heart with blood.

CORONARY Arteries, are two arteries ſpringing out of the aorta, before it leaves the pericardium. See ANATOMY *Index*.

CORONARY Vein, a vien diffuſed over the exterior ſurface of the heart. See ANATOMY *Index*.

Stomachic CORONARY, a vein inſerted into the trunk of the ſplenic vein, which, by uniting with the meſenteric, forms the vena porta. See ANATOMY *Index*.

CORONARIÆ, in *Botany*, the 10th order of plants, in Linnæus's Fragments of a Natural Method: Under this name, inſtead of the more obvious one *libaccæ*, Linnæus collects a great number of genera, moſt of which furniſh very beautiful garden flowers, viz. albuca, cyanella, fritillaria, helonias, hyacinthus, hypoxis, lilium, melanthium, ornithogalum, ſcilla, tulipa, agave, aletris, aloe, anthericum, aſphodelus, bromelia, burmannia, hemerocallis, polyanthes, tillandſia, veratrum, yucca.

CORONATION, the ceremony of inveſting with a crown, particularly applied to the crowning of kings, upon their ſucceeding to the ſovereignty. See KING.

CORONÆ, in *Ancient Geography*, a town of Bœotia, near Mount Helicon, and the lake Copais, ſituated on an eminence: famous for the defeat of the Athenians and Bœotians by Ageſilaus. Another Corona of Theſſaly; having Narthacium to the eaſt, and Lamia near the Sperchius to the north (Ptolemy).

CORONE, in *Ancient Geography*, a town of Meſſenia, ſituated on the ſea, giving name to the Sinus Coronæus, (Pliny); now *Golfo di Coron*. Pauſanias takes it to be the *Aepea* of Homer; but Strabo *Thuria*, and Pliny *Pedaſus*, now *Coron*, in the territory of Belvidere, in the Morea. E. Long. 22. N. Lat. 36. 30.

CORONELLI, VINCENT, a famous geographer, born at Venice. His ſkill in the mathematics having brought him to the knowledge of the count d'Eſtrees, his eminence employed him in making globes for Louis XIV. With this view Coronelli ſpent ſome time at Paris, and left a great number of globes there, which are eſteemed. In 1685, he was made coſmographer to the republic of Venice; and four years after public profeſſor of geography. He founded an academy of coſmography at Venice; and died in that city in 1718. He publiſhed about 400 geographical charts, an abridgment of coſmography, ſeveral books on geography, and other works.

CORONER (*coronator*), an ancient officer in England, ſo called becauſe he hath principally to do with pleas of the crown, or ſuch wherein the king is more immediately concerned. And in this light the lord chief juſtice of the king's bench is the principal coroner in the kingdom; and may, if he pleaſes, exerciſe the juriſdiction of a coroner in any part of the realm. But there are alſo particular coroners for every county in England; uſually four, but ſometimes ſix, and ſometimes fewer. This officer is of equal authority with the ſheriff; and was ordained, together with him, to keep the peace, when the earls gave up the wardſhip of the county.

He is choſen by all the freeholders of the county court; and by the ſtatute of Weſtminſter 1. it was enacted, that none but lawful and diſcreet knights ſhould be choſen; but it ſeems now ſufficient if a man have lands enough to be made a knight, whether he be really knighted or not; for the coroner ought to have an eſtate ſufficient to maintain the dignity of his office, and anſwer any fines that may be made upon him for his miſbehaviour; and, if he hath not enough to anſwer, his fine ſhall be levied on the county, as a puniſhment for electing an inſufficient officer. Now, indeed, through the culpable neglect of gentlemen of property, this office has been ſuffered to fall into diſrepute, and get into low and indigent hands; ſo that although formerly no coroners would be paid for ſerving their country, and they were by the aforeſaid ſtatute of Weſtminſter 1. expreſsly forbidden to take a reward under pain of great forfeiture to the king, yet for many years paſt they have only deſired to be choſen for the ſake of their perquiſites; being allowed fees for their attendance by the ſtatute 3 Hen. VII. c. 1. which Sir Edward Coke complains of heavily, though ſince his time thoſe fees have been much enlarged.

The coroner is choſen for life; but may be removed, either by being made ſheriff or choſen verderor, which are offices incompatible with the other; and by the ſtatute 25 Geo. II. c. 29. extortion, neglect, or miſbehaviour, are alſo made cauſes of removal.

The office and power of a coroner are alſo, like thoſe of the ſheriff, either judicial or miniſterial; but principally judicial. This is in great meaſure aſcertained by ſtatute 4 Edw. I. *De officio coronatoris;* and conſiſts, firſt, in inquiring, when any perſon is ſlain, or dies ſuddenly, or in priſon, concerning the manner of his death. And this muſt be *ſuper viſum corporis;* for if the body is not found, the coroner cannot ſit. He muſt alſo ſit at the very place where the death happened. And his inquiry is made by a jury from four, five, or ſix, of the neighbouring towns, over whom he is to preſide. If any be found guilty by this inqueſt of murder, he is to commit to priſon for farther trial, and is alſo to inquire concerning their lands, goods, and chattels, which are forfeited thereby; but whether it be murder or not, he muſt inquire whether any deodand has accrued to the king, or the lord of the franchiſe, by this death; and muſt certify the whole of this inquiſition to the court of king's bench, or the next aſſizes. Another branch of his office is to inquire concerning ſhipwrecks; and certify whether wreck or not, and who is in poſſeſſion of the goods. Concerning treaſure-trove, he is alſo to inquire concerning the finders, and where it is, and whether any one be ſuſpected of having found and concealed a treaſure; "and that may well be perceived (ſaith the old ſtatute of Edw. I.), where one liveth riotouſly, haunting taverns, and hath done ſo of long time;" whereupon he might be attached and held to bail upon this ſuſpicion only.

The miniſterial office of the coroner is only as the ſheriff's ſubſtitute. For when juſt exception can be taken to the ſheriff, for ſuſpicion of partiality (as that he is intereſted in the ſuit, or of kindred to either plaintiff or defendant), the proceſs muſt then be awarded to the coroner, inſtead of the ſheriff, for execution of the king's writs.

CORONET. See Crown.

Coronet, or *Cornet*, of a horſe, the loweſt part of the paſtern, which runs round the coffin, and is diſtinguiſhed by the hair joining and covering the upper part of the hoof.

CORONILLA, *jointed-podded* Colutea; a genus of plants belonging to the diadelphia claſs, and in the natural method ranking under the 32d order, *Papilionaceæ*. See Botany *Index*.

CORONOID, and Condyloid, proceſſes. See Anatomy *Index*.

CORPORA cavernosa, in *Anatomy*, two ſpongious bodies, called alſo *corpora nervoſa* and *corpus ſpongioſum*. See Anatomy *Index*.

Corpora *Pyramidalia*, are two protuberances of the under part of the *cerebellum*, about an inch long; ſo called from their reſemblance to a pyramid. See Anatomy *Index*.

Corpora *Striata*. See Anatomy *Index*.

CORPORAL, an inferior officer under a ſergeant, in a company of foot, who has charge over one of the diviſions, places and relieves ſentinels, and keeps good order in the corps de garde; he alſo receives the word from the inferior rounds, which paſſes by his corps de garde. This officer carries a fuſee, and is commonly an old ſoldier; there are generally three corporals in each company.

Corporal *of a Ship of War*, an officer under the maſter at arms, employed to teach the officers the exerciſe of ſmall arms, or of muſketry; to attend at the gangway, on entering ports, and obſerve that no ſpirituous liquors are brought into the ſhip, unleſs by expreſs leave from the officers. He is alſo to extinguiſh the fire and candles at eight o'clock in winter, and nine in ſummer, when the evening gun is fired; and to walk frequently down in the lower decks in his watch, to ſee that there are no lights but ſuch as are under the charge of proper ſentinels.

Corporal (*Corporale*), is alſo an ancient church-term, ſignifying the ſacred linen ſpread under the chalice in the euchariſt and maſs, to receive the fragments of the bread, if any chance to fall. Some ſay it was Pope Euſebius who firſt enjoined the uſe of the corporal; others aſcribe it to St Sylveſter. It was the cuſtom to carry corporals, with ſome ſolemnity, to fires, and to heave them againſt the flames, in order to extinguiſh them. Philip de Comines ſays, the pope made Louis XI. a preſent of the corporale whereon my lord St Peter ſung maſs.

CORPORATION, a body politic or incorporate, ſo called, becauſe the perſons or members are joined into one body, and are qualified to take, grant, &c.

Of corporations there is a great variety ſubſiſting, for the advancement of religion, of learning, and of commerce; in order to preſerve entire and for ever thoſe rights and immunities, which, if they were granted only to thoſe individuals of which the body corporate is compoſed, would upon their death be utterly loſt and extinct. To ſhow the advantages of theſe incorporations, let us conſider the caſe of a college in either of our univerſities, founded *ad ſtudendum et orandum*, for the encouragement and ſupport of religion and learning. If this was a mere voluntary aſſembly, the individuals which compoſe it might indeed read, pray, ſtudy, and perform ſcholaſtic exerciſes together, ſo long as they could agree to do ſo; but they could neither frame nor receive any laws or rules of their conduct; none at leaſt which would have any binding force, for want of a coercive power to create a ſufficient obligation. Neither could they be capable of retaining any privileges or immunities:

for, if ſuch privileges be attacked, which of all this unconnected aſſembly has the right or ability to defend them? And, when they are diſperſed by death or otherwiſe, how ſhall they transfer theſe advantages to another ſet of ſtudents, equally unconnected as themſelves? So alſo, with regard to holding eſtates or other property, if land be granted for the purpoſes of religion or learning to 20 individuals not incorporated, there is no legal way of continuing the property to any other perſons for the ſame purpoſes, but by endleſs conveyances from one to the other, as often as the hands are changed. But when they are conſolidated and united into a corporation, they and their ſucceſſors are then conſidered as one perſon in law: as one perſon, they have one will, which is collected from the ſenſe of the majority of the individuals: this one will may eſtabliſh rules and orders for the regulation of the whole, which are a ſort of municipal laws of this little republic; or rules and ſtatutes may be preſcribed to it at its creation, which are then in the place of natural laws: the privileges and immunities, the eſtates and poſſeſſions, of the corporation, when once veſted in them, will be for ever veſted, without any new conveyance to new ſucceſſions; for all the individual members that have exiſted from the foundation to the preſent time, or that ſhall ever hereafter exiſt, are but one perſon in law, a perſon that never dies: in like manner as the river Thames is ſtill the ſame river, though the parts which compoſe it are changing every inſtant.

The honour of originally inventing theſe political conſtitutions entirely belongs to the Romans. They were introduced, as Plutarch ſays, by Numa; who finding, upon his acceſſion, the city torn to pieces by the two rival factions of Sabines and Romans, thought it a prudent and politic meaſure to ſubdivide theſe two into many ſmaller ones, by inſtituting ſeparate ſocieties of every manual trade and profeſſion. They were afterwards much conſidered by the civil law, in which they were called *univerſitates*, as forming one whole out of many individuals; or *collegia*, from being gathered together: they were adopted alſo by the canon law, for the maintenance of eccleſiaſtical diſcipline; and from them our ſpiritual corporations are derived. But our laws have conſiderably refined and improved upon the invention, according to the uſual genius of the Engliſh nation, particularly with regard to ſole corporations, conſiſting of one perſon only, of which the Roman lawyers had no notion; their maxim being that, *Tres faciunt collegium;* though they held, that if a corporation, originally conſiſting of three perſons, be reduced to one, *Si univerſitas ad unum redit;* it may ſtill ſubſiſt as a corporation, *Et ſtet nomen univerſitatis.*

As to the ſeveral ſorts of corporations, the firſt diviſion of them is into *aggregate* and *ſole*. Corporations aggregate conſiſt of many perſons united together into one ſociety, and are kept up by a perpetual ſucceſſion of members, ſo as to continue for ever: of which kind are the mayor and commonalty of a city, the head and fellows of a college, the dean and chapter of a cathedral church. Corporations ſole conſiſt of one perſon only and his ſucceſſors, in ſome particular ſtation, who are incorporated by law, in order to give them ſome legal capacities and advantages, particularly that of perpetuity, which in their natural perſons they could not have had. In this ſenſe the king is a ſole corporation; ſo is a biſhop; ſo are ſome deans and prebendaries, diſtinct from their ſeveral chapters; and ſo is every parſon and vicar. And the neceſſity, or at leaſt uſe, of this inſtitution will be very apparent, if we conſider the caſe of a parſon of a church. At the original endowment of pariſh-churches, the freehold of the church, the church-yard, the parſonage-houſe, the glebe, and the tithes of the pariſh, were veſted in the then parſon by the bounty of the donor, as a temporal recompenſe to him for his ſpiritual care of the inhabitants, and with intent that the ſame emoluments ſhould ever afterwards continue as a recompenſe for the ſame care. But how was this to be effected? The freehold was veſted in the parſon; and, if we ſuppoſe it veſted in his natural capacity, on his death it might deſcend to his heir, and would be liable to his debts and incumbrances: or at beſt, the heir might be compellable, at ſome trouble and expence, to convey theſe rights to the ſucceeding incumbent. The law therefore has wiſely ordained, that the parſon, *quatenus* parſon, ſhall never die, any more than the king; by making him and his ſucceſſors a corporation. By which means all the original rights of the parſonage are preſerved entire to the ſucceſſor; for the preſent incumbent, and his predeceſſor who lived ſeven centuries ago, are in law one and the ſame perſon; and what was given to the one was given to the other alſo.

Another diviſion of corporations, either ſole or aggregate, is into *eccleſiaſtical* and *lay*. Eccleſiaſtical corporations are, where the members that compoſe it are entirely ſpiritual perſons, ſuch as biſhops, certain deans and prebendaries, all archdeacons, parſons, and vicars, which are ſole corporations; deans and chapters at preſent, and formerly prior and convent, abbot and monks, and the like, bodies aggregate. Theſe are erected for the furtherance of religion, and perpetuating the rights of the church.—Lay corporations are of two ſorts, *civil* and *eleemoſynary*. The civil are ſuch as are erected for a variety of temporal purpoſes. The king, for inſtance, is made a corporation, to prevent in general the poſſibility of an *interregnum* or vacancy of the throne, and to preſerve the poſſeſſions of the crown entire; for immediately upon the demiſe of one king, his ſucceſſor is in full poſſeſſion of the regal rights and dignity. Other lay corporations are erected for the good government of a town or particular diſtrict, as a mayor and commonalty, bailiff and burgeſſes, or the like: ſome for the advancement and regulation of manufactures and commerce; as the trading companies of London and other towns: and ſome for the better carrying on of divers ſpecial purpoſes; as church wardens, for conſervation of the goods of the pariſh; the college of phyſicians and company of ſurgeons in London, for the improvement of the medical ſcience; the royal ſociety for the advancement of natural knowledge; and the ſociety of antiquarians for promoting the ſtudy of antiquities. The eleemoſynary ſort are ſuch as are conſtituted for the perpetual diſtribution of the free alms or bounty of the founder of them to ſuch perſons as he has directed. Of this kind are all hoſpitals for the maintenance of the poor, ſick, and impotent; and all colleges, both *in* our univerſities and *out* of them: which colleges are founded for two purpoſes: 1. For the promotion of piety and learning by proper regulations and ordinances. 2. For imparting aſſiſtance to the members of thoſe bodies, in order to enable them to proſecute their devotion and ſtudies with greater eaſe and aſſiduity. And all theſe eleemoſynary corporations are, ſtrictly ſpeaking, lay, and not eccleſiaſtical, even though compoſed of eccleſiaſtical perſons, and although they in ſome things partake of the nature, privileges, and reſtrictions of eccleſiaſtical bodies.

Having thus marſhalled the ſeveral ſpecies of corporations, let us next proceed to conſider, 1. How corporations in general may be created. 2. What are their powers, capacities, and incapacities. And, 3. How they may be diſſolved.

I. Corporations, by the civil law, ſeem to have been created by the mere act and voluntary aſſociation of their members; provided ſuch convention was not contrary to law, for then it was *illicitum collegium.* It does not appear that the prince's conſent was neceſſary to be actually given to the foundation of them; but merely that the original founders of theſe voluntary and friendly ſocieties (for they were little more than ſuch) ſhould not eſtabliſh any meetings in oppoſition to the laws of the ſtate.

But in England the king's conſent is abſolutely neceſſary to the erection of any corporation, either impliedly or expreſsly given. The king's implied conſent is to be found in corporations which exiſt by force of the common law, to which our former kings are ſuppoſed to have given their concurrence; common law being nothing elſe but cuſtom, ariſing from the univerſal agreement of the whole community. Of this ſort are the king himſelf, all biſhops, parſons, vicars, church-wardens, and ſome others; who by common law have ever been held (as far as our books can ſhow us) to have been corporations, *virtute officii;* and this incorporation is ſo inſeparably annexed to their offices, that we cannot frame a complete legal idea of any of theſe perſons, but we muſt alſo have an idea of a corporation, capable to tranſmit his rights to his ſucceſſors, at the ſame time. Another method of implication, whereby the king's conſent is preſumed, is as to all corporations by preſcription, ſuch as the city of London, and many others, which have exiſted as corporations, time whereof the memory of man runneth out to the contrary; and therefore are looked upon in law to be well created. For though the members thereof can ſhow no legal charter of incorporation, yet in caſes of ſuch high antiquity the law preſumes there once was one; and that by the variety of accidents, which a length of time may produce, the charter is loſt or deſtroyed. The methods by which the king's conſent is expreſsly given, are either by act of parliament or charter. By act of parliament, of which the royal aſſent is a neceſſary ingredient, corporations may undoubtedly be created: but it is obſervable, that moſt of thoſe ſtatutes which are uſually cited as having created corporations, do either confirm ſuch as have been before created by the king; as in the caſe of the college of phyſicians, erected by charter 10 Hen. VIII. which charter was afterwards confirmed in parliament: or, they permit the king to erect a corporation *in futuro* with ſuch and ſuch powers; as is the caſe of the bank of England, and the ſociety of the Britiſh fiſhery. So that the immediate creative act is uſually performed by the king alone, in virtue of his royal prerogative.

All the other methods therefore whereby corporations exiſt, by common law, by preſcription, and by act of parliament, are for the moſt part reducible to this of the king's letters patent, or charter of incorporation. The king's creation may be performed by the words *creamus*, *erigimus*, *fundamus*, *incorporamus*, or the like. Nay it is held, that if the king grants to a ſet of men to have *gildam mercatorium*, "a mercantile meeting or aſſembly," this is alone ſufficient to incorporate and eſtabliſh them for ever.

The king (it is ſaid) may grant to a ſubject the power of erecting corporations, though the contrary was formerly held; that is, he may permit the ſubject to name the perſons and powers of the corporation at his pleaſure; but it is really the king that erects, and the ſubject is but the inſtrument; for though none but the king can make a corporation, yet *qui facit per alium, facit per ſe.* In this manner the chancellor to the univerſity of Oxford has power by charter to erect corporations; and has actually often exerted it in the erection of ſeveral matriculated companies, now ſubſiſting, of tradeſmen ſubſervient to the ſtudents.

When a corporation is erected, a name muſt be given to it; and by that name alone it muſt ſue and be ſued, and do all legal acts.

II. After a corporation is ſo formed and named, it acquires many powers and rights, which we are next to conſider. Some of theſe are neceſſarily and inſeparably incident to every corporation; which incidents as ſoon as a corporation is duly erected, are tacitly annexed of courſe. As, 1. To have perpetual ſucceſſion. This is the very end of its incorporation; for there cannot be a ſucceſſion for ever without an incorporation; and therefore all aggregate corporations have a power neceſſarily implied of electing members in the room of ſuch as go off. 2. To ſue or be ſued, implead or be impleaded, grant or receive, by its corporate name, and do all other acts as natural perſons may. 3. To purchaſe lands and hold them, for the benefit of themſelves and their ſucceſſors: which two are conſequential to the former. 4. To have a common ſeal. For a corporation, being an inviſible body, cannot manifeſt its intention by any perſonal act or oral diſcourſe: it otherwiſe acts and ſpeaks only by its common ſeal. For though the particular members may expreſs their private conſents to any act by words or ſigning their names, yet this does not bind the corporation; it is the fixing of the ſeal, and that only, which unites the ſeveral aſſents of the individuals who compoſe the community, and makes one joint aſſent of the whole. 5. To make by-laws or private ſtatutes for the better government of the corporation; which are binding upon themſelves, unleſs contrary to the laws of the land, and then they are void. But no trading company is with us allowed to make by-laws which may affect the king's prerogative or the common profit of the people, under penalty of 40l. unleſs they be approved by the chancellor, treaſurer, and chief juſtices, or the judges of aſſize in their circuits; and even though they be ſo approved, ſtill, if contrary to law, they are void. Theſe five powers are inſeparably incident to every corporation, at leaſt to every

Corporation.

ration aggregate: for two of them, though they may be practiſed, yet are very unneceſſary to a corporation ſole; viz. to have a corporate ſeal to teſtify his ſole aſſent, and to make ſtatutes for the regulation of his own conduct.

Corporations have a capacity to purchaſe lands for themſelves and ſucceſſors; but they are excepted out of the ſtatute of wills; ſo that no deviſe of lands to a corporation by will is good; except for charitable uſes, by ſtat. 43 Eliz. c. 4. which exception is again greatly narrowed by the ſtat. 9 Geo. II. c. 36. And alſo, by a great variety of ſtatutes, their privilege even of purchaſing from any living granter is much abridged; ſo that now a corporation, either eccleſiaſtical or lay, muſt have a licenſe from the king to purchaſe, before they can exert that capacity which is veſted in them by the common law: nor is even this in all caſes ſufficient. Theſe ſtatutes are generally called the ſtatutes of *mortmain*. See MORTMAIN.

Blackſtone's Comment.

The general duties of all bodies politic, conſidered in their corporate capacity, may, like thoſe of natural perſons, be reduced to this ſingle one; that of acting up to the end or deſign, whatever it be, for which they were created by their founder.

III. How corporations may be diſſolved. Any particular member may be diſfranchiſed, or loſe his place in the corporation, by acting contrary to the laws of the ſociety, or the laws of the land: or he may reſign it by his own voluntary act. But the body politic may alſo itſelf be diſſolved in ſeveral ways; which diſſolution is the civil death of the corporation; and in this caſe their lands and tenements ſhall revert to the perſon, or his heirs, who granted them to the corporation; for the law doth annex a condition to every ſuch grant, that if the corporation be diſſolved, the granter ſhall have the lands again, becauſe the cauſe of the grant faileth. The grant is indeed only during the life of the corporation; which may endure for ever: but when that life is determined to be the diſſolution of the body politic, the granter takes it back by reverſion, as in the caſe of every other grant for life. The debts of a corporation, either to or from it, are totally extinguiſhed by its diſſolution; ſo that the members thereof cannot recover, or be charged with them, in their natural capacities: agreeable to that maxim of the civil law, *Si quid univerſitati debetur, ſingulis non debetur*; *nec, quod debet univerſitas, ſinguli debent.*

A corporation may be diſſolved, 1. By act of parliament, which is boundleſs in its operations. 2. By the natural death of all its members, in caſes of an aggregate corporation. 3. By ſurrender of its franchiſes into the hands of the king, which is a kind of ſuicide. 4. By forfeiture of its charter, through negligence or abuſe of its franchiſes, in which caſe the law judges that the body politic has broken the conditions upon which it was incorporated, and therefore the incorporation is void. And the regular courſe is to bring an information in nature of a writ of *quo warranto*, to inquire by what warrant the members now exerciſe their corporate power, having forfeited it by ſuch and ſuch proceedings. The exertion of this act of law, for the purpoſes of the ſtate, in the reigns of King Charles and King James II. particularly by ſeizing the charter of the city of London, gave great and juſt offence; though perhaps, in ſtrictneſs of law, the proceedings in moſt of them were ſufficiently regular; but the judgment againſt that of London was reverſed by act of parliament after the revolution; and by the ſame ſtatute it is enacted, that the franchiſes of the city of London ſhall never more be forfeited for any cauſe whatſoever. And becauſe by the common law corporations were diſſolved, in caſe the mayor or head officer was not duly elected on the day appointed in the charter or eſtabliſhed by preſcription, it is now provided, that for the future no corporation ſhall be diſſolved upon that account, and ample directions are given for appointing a new officer, in caſe there be no election, or a void one, made upon the charter or preſcriptive day.

Corporation ‖ Corpulency.

CORPORATION Act, is that which prevents any perſon from being legally elected into any office relating to the government of any city or corporation, unleſs within a twelvemonth before he has received the ſacrament of the Lord's Supper according to the rites of the church of England; and which enjoins him to take the oaths of allegiance and ſupremacy when he takes the oath of office; otherwiſe his election is void.

CORPOREAL, thoſe qualities which denominate a body. See INCORPOREAL.

CORPOREITY, the quality of that which is corporeal, or has body; or that which conſtitutes or denominates it ſuch.—The corporeity of God was the capital error of the Anthropomorphites. Some authors reproach Tertullian with admitting a corporeity in the Deity; but it is manifeſt, by *body* he means no more than *ſubſtance.*—The Mahometans reproach the Samaritans at this day, with a belief of the corporeity of God. Many of the ancients believed the corporeity of angels.

CORPSE, a dead body.

If any one, in taking up a dead body, ſteals the ſhroud, or other apparel, it will be felony. Stealing only the corpſe itſelf is not felony; but it is puniſhable as a miſdemeanor by indictment at common law.

CORPS, in *Architecture*, is a term borrowed from the French, ſignifying any part that projects or advances beyond the naked of a wall; and which ſerves as a ground for ſome decoration or the like.

CORPS de Battaille, is the main body of an army drawn up for battle.

CORPS de Garde, a poſt in an army, ſometimes under covert, ſometimes in the open air, to receive a body of ſoldiers, who are relieved from time to time, and are to watch in their turns, for the ſecurity of a quarter, a camp, ſtation, &c.—The word is alſo uſed for the men who watch therein. It is uſual to have, beſide the great, a little corps de garde, at a good diſtance before the lines; to be the more readily advertiſed of the approach of the enemy.

CORPULENCY, the ſtate of a perſon too much loaded with fleſh or fat.

Corpulency is the occaſion of various diſeaſes, and particularly the apoplexy. It was held infamous among the ancient Lacedæmonians.

Sennertus mentions a man that weighed 600 pounds, and a maid 36 years of age who weighed 450. Bright of Malden, who died at the age of 29 years in 1750, weighed 616 pounds. Chiapin Vitelli, marquis of Cerona, a noted Spaniſh general in his time, from an exceſſive corpulency, is ſaid to have reduced himſelf by drinking of vinegar, to ſuch a degree of leanneſs, that he could fold his ſkin ſeveral times round him.

Caſtile ſoap, in the form of a bolus, an electuary, pills, or diſſolved in a gill or more of ſoft water, from one to four drachms taken at bed-time, is ſtrongly recommended with a view of reducing corpulency, in a diſcourſe on its nature, cauſes, and cure, by Malcolm Flemyng, M. D. Lond. 1760. See MEDICINE *Index*.

CORPUS, in *Anatomy*, is applied to ſeveral parts of the animal ſtructure; as *corpus calloſum*, *corpus cavernoſum*, &c. See ANATOMY *Index*.

CORPUS is alſo uſed in matters of learning, for ſeveral works of the ſame nature collected and bound together.

Gratian made a collection of the canons of the church, called *corpus canonum*. The *corpus* of the civil law is compoſed of the digeſt, code, and inſtitutes. We have alſo a *corpus* of the Greek poets; and another of the Latin poets.

CORPUS Chriſti, a feſtival of the church of England, kept on the next Thurſday after Trinity Sunday, inſtituted in honour of the euchariſt; to which alſo one of the colleges of Oxford is dedicated.

CORPUSCLE, in *Phyſics*, a minute particle, or phyſical atom, being ſuch as a natural body is made up of. By this word is not meant the elementary particles, nor hypoſtatical principles of chemiſts; but ſuch particles, whether of a ſimple or compound nature, whoſe parts will not be diſſolved nor diſſipated by ordinary degrees of heat.

CORPUSCULAR PHILOSOPHY, is that way of philoſophiſing which endeavours to explain things, and to account for the phenomena of nature, by the motion, figure, reſt, poſition, &c. of the corpuſcles, or the minute particles of matter.

Mr Boyle ſums up the chief principles of the corpuſcular hypotheſis, which now flouriſhes under the mechanical philoſophy in theſe particulars:

1. They ſuppoſe that there is but one catholic or univerſal matter, which is an extended, impenetrable, and diviſible ſubſtance, common to all bodies, and capable of all forms. 2. That this matter, in order to form the vaſt variety of natural bodies, muſt have motion in ſome or all its aſſignable parts; and that this motion was given to matter by God the Creator of all things, and has all manner of directions and tendencies. 3. Matter muſt alſo be actually divided into parts, and each of theſe primitive particles, fragments, or atoms of matter muſt have its proper magnitude or ſize, as alſo its peculiar figure or ſhape. 4. They ſuppoſe alſo, that theſe differently ſized and ſhaped particles may have as different orders and poſitions, whereof great variety may ariſe in the compoſition of bodies.

CORRADINI DE SEZZA, *Peter Marcellinus*, a learned civilian and cardinal, born at Sezza, in 1658, acquired the eſteem and confidence of Clement XI. and died at Rome in 1743. He was the author of a learned and curious work, entitled, "Vetus Latium profanum et ſacrum," 2 vols folio; and a hiſtory of Sezza, in 4to.

CORRADO, SEBASTIAN, an Italian grammarian of the 16th century, taught the Greek and Latin tongues at Reggio, where he formed an academy of polite literature; and at length removed to Bologna, in order to be profeſſor of thoſe languages. He wrote ſeveral works, the moſt eſteemed of which are, "*Quæſtura in qua Ciceronis vita refertur*," an excellent performance; and, "*de Lingua Latina*." He died in 1556.

CORRECTION, in *Printing*, the act of retrenching the faults in a work; or the reading which the corrector gives the firſt proofs, to point out and amend the faults, to be rectified by the compoſitor.

The corrections are placed on the margin of each page, right againſt the line where the faults are found. There are different characters uſed to expreſs different corrections, as D or ∂, *dele*, for any thing to be effaced or left out. When any thing is to be inſerted, the place is marked in the line with a caret ʌ, and the inſertion added in the margin. When a word, ſyllable, &c. is to be altered, it is eraſed out of the proof, and that to be put in its room written in the margin; always obſerving, if there be ſeveral miſtakes in the ſame line, that the corrections in the margin be ſeparated by little bars, or ſtrokes, |. If a ſpace be omitted, its place is marked with a caret, and the margin with #. If a ſpace be wrong placed, as in the middle of a word, the two parts are connected with a cu‿rve, and the ſame character put in the margin. If a letter be inverted, it is expreſſed on the margin with 9. If any thing be tranſpoſed, it is marked thus: *The ſhorteſt |are the| follies| beſt*; for *the ſhorteſt follies are the beſt*; and in the margin is added *tr.* in a circle. If Roman characters are to be changed for Italic, or *vice verſa*, a line is drawn under them thus, and *Roman* or *Italic* added in the margin; if to capitals, a double line. If a word or ſentence is entirely omitted, the place is marked with a caret, and in the margin is inſerted the word *out*. If the letters of a word ſtand too far aſunder, a line is drawn under them, and in the margin is put a crooked line or hook, thus ‿.

CORRECTION Houſe, a place of confinement, where vagrants and perſons guilty of crimes of an inferior degree, ſuffer puniſhment by being obliged to labour for a certain period of time, as for months or years, according to the nature of the crime. The benefit ariſing to ſociety, and the reformation of offenders, from this mode of puniſhment, have been variouſly eſtimated by different writers, according to the views which they have taken of the effects and conſequences which are ſuppoſed to follow the confinement and reſtraint to which the criminal is ſubjected. It has been regarded as one of the greateſt defects of the laws of this country, that, excepting the puniſhment of death, there is no other which is accompanied with that degree of ſeverity and terror to awe or reſtrain offenders from the commiſſion of crimes. To this purpoſe are the following obſervations of Dr Paley. The laws of England, he ſays, "are not provided with any other puniſhment than that of death, ſufficiently terrible to keep offenders in awe. Tranſportation which is the puniſhment ſecond in the order of ſeverity, anſwers the purpoſe of example very imperfectly; not only becauſe exile is in reality a ſlight puniſhment to thoſe who have neither property, nor friends, nor regular means of ſubſiſtence at home, but becauſe the puniſhment, whatever it be, is unobſerved and unknown. A tranſported convict *may* ſuffer under his ſentence, but his ſufferings are removed from the view of his countrymen; his miſery is unſeen; his condition ſtrikes no terror into the minds of thoſe for whoſe warning and admonition it was intended. This chaſm in the ſcale of puniſhment produces alſo two farther imperfections in the adminiſtration of penal juſtice; of which the firſt is, that the ſame puniſhment is extended to crimes of very different characters and malignancy; and the ſecond, that puniſhments, ſeparated by a great interval, are aſſigned to crimes hardly diſtinguiſhable in their guilt and miſchief."

This defect, it has been ſuppoſed, might be made up by the proper management of houſes of correction. For as the object of puniſhment is not only the amendment of the offender, but is alſo intended to operate as an example to others, both theſe objects ſeem to be more certainly attained by the confinement and labour to which criminals are ſubjected in houſes of this deſcription than by any ſpecies of puniſhment provided by the laws of Britain. It is greatly to be regretted that the puniſhments inflicted by the laws of this country, whether impriſonment or exile, pain or infamy, have rarely the effect of producing any reformation of the criminal. On the contrary, he often returns to the world more hardened in crime, and more determined in his wicked courſes. Houſes of correction might probably in this reſpect be attended with more beneficial conſequences. This ſeems to be the caſe with the Amſterdam houſe of correction, an account of which in this view will not, it is hoped, be unacceptable to our readers. It is extracted from the Journal of the Travels of M. Thouin.

The Amſterdam correction houſe, from the employment of the priſoners confined in it, is called the *raſping-houſe*, and is deſtined to the reception of thoſe malefactors whoſe crimes do not amount to a capital offence. Their puniſhment cannot ſo properly be denominated ſolitary confinement as a ſequeſtration from ſociety during a limited term of years. The building is ſituated in a part of the ſuburbs to the north-eaſt of the city. The exterior has nothing remarkable, either with reſpect to form or extent. It is detached from the ſtreet by a ſpacious court, which contains the keeper's lodge, together with apartments for the different ſervants belonging to the eſtabliſhment. Over the gate, which opens from this court into the priſon, are placed two ſtatues, as large as liſe, repreſenting two men in the act of ſawing a piece of logwood.

The inner court is in the form of a ſquare, round which are arranged the apartments of the priſoners, together with the neceſſary warehouſes. One part of the ground ſtory is divided into different chambers; the other ſerves as a depot for the logwood, and the implements employed in its preparation.

The keeper, whoſe countenance, contrary to the general cuſtom of perſons of his profeſſion, was ſtrongly indicative of urbanity and gentleneſs, introduced M. Thouin into an apartment where two priſoners were at work in ſawing a large log of Campeachy wood. The ſaw is compoſed of four blades joined together, with very ſtrong, large, and ſharp teeth, which make a ſciſſure in the wood of nearly two inches in breadth. The operation is repeated, till the pieces become too ſmall to undergo the ſaw, when they are ground in mills peculiarly conſtructed for this purpoſe.

This employment requires an extraordinary exertion of ſtrength, and is at firſt a ſevere penance even to robuſt perſons; but habit, addreſs, and practice, ſoon render it eaſy; and the priſoners in a ſhort time become competent to furniſh, without painful exertion, their weekly contingent of 200 lb. weight of ſawed pieces. After completing this taſk, they even find time to fabricate a variety of little articles in wood and ſtraw, which they ſell to thoſe who viſit the priſon, or diſpoſe of, by means of agents, in the town.

M. Thouin next inſpected three apartments of different dimenſions, which opened into the inner court. The one was inhabited by four, the ſecond by ſix, and the third by ten priſoners. The furniture of the rooms conſiſted in hammocks, with a mattreſs, a blanket, and a coverlid to each, tables, chairs, and ſtools, glaſs and earthen veſſels, and various other articles of convenience. Every thing in theſe apartments was diſtinguiſhed by neatneſs and propriety; and notwithſtanding the number of inhabitants allotted to each was fully adequate to the dimenſions of the rooms, the ſenſes were not offended with any diſagreeable ſcent, and the air was in every reſpect as pure and wholeſome as the ſurrounding atmoſphere.

In an obſcure part of the building are a number of cells, in which formerly thoſe priſoners who revolted againſt the proper ſubordination of the place, or ill-treated their comrades, were confined for a few days. But the keeper aſſured M. Thouin that theſe cells had not been made uſe of for upwards of 10 years. They are dark gloomy dungeons, with only a ſmall aperture for the admiſſion of light and air. The ſuppreſſion of this barbarous and coercive puniſhment does honour to the humanity of government.

The ſtore-rooms are filled with various kinds of wood for the purpoſes of dyeing; as the *hæmatoxylum campechianum*, the *morus tinctoria*, the *cæſalpinia ſappan*, &c. They are all exotics, with the exception of the *evonymus Europæus*. The warehouſes were not of ſufficient extent to contain the quantity of wood, which was depoſited in piles in different parts of the court.

The priſoners, amounting to 76 in number, were uniformly habited in coarſe woollens; wear very good ſtockings, large leather ſhoes, white ſhirts, and caps or hats. They are, by the rules of the houſe, obliged to frequent ablutions, which greatly contribute to the preſervation of their health. There was only one ſick perſon amongſt them; and, what is not a little remarkable, almoſt all the priſoners had formerly lived in large commercial towns; very few villagers were amongſt them. They had all been ſentenced to impriſonment for theft; but it depends upon themſelves, by reformation and good behaviour, to ſhorten the term of their confinement, which many of them frequently do.

The keeper, whoſe humanity to the unfortunate perſons committed to his care entitles him rather to the title of their protector than their gaoler (and M. Thouin informs us, that the priſoners generally called him by no other name than *father*), aſſiſts them with his counſels and friendly admonitions. He regiſters every week, in a book appropriated to this purpoſe, both the inſtances of good and bad behaviour, which is annually ſubmitted to the examination of the magiſtracy, who, from this report, abridge or prolong the term of confinement, according to the degree of indulgence which each priſoner appears to merit. Caſes frequently happen where a malefactor, condemned to an impriſonment of eight years, by his good behaviour procures his enlargement at the expiration of four; and ſo in proportion for a ſhorter term. But great attention is paid to diſcriminate between actual reform and hypocritical artifice.

The reward of good behaviour is not, however, confined to, or withheld till, the period of actual liberation. Their reſtoration to ſociety is preceded by a progreſſive amelioration of their lot. Their work is gradually rendered leſs laborious, they are accommodated with ſeparate apartments, and employed in the ſervices of domeſtic economy. The keeper even entruſts them with commiſſions beyond the precincts of the priſon; and ſcarce a ſingle inſtance has occurred of their abuſing this indulgence. By this prudent management, a conſiderable ſaving is effected in the expence of the eſtabliſhment, at the ſame time that it tends to wear away prejudice, and to initiate the priſoners by gradual advances into the reciprocal duties of ſocial life.

M. Thouin made particular inquiries whether it was cuſtomary for perſons after their diſcharge to be confined a ſecond and third time, as is but too often the caſe in many countries, for a repetition of their offence. He was informed, that ſuch inſtances very rarely occur; but the caſe is not without precedent, as he obſerved in the perſon of a young Jew, who was then in the raſping-houſe for the third time. The caſe of this man is ſomewhat extraordinary. During the period of his detention, he always conforms, with the moſt ſcrupulous obſervance, to the rules of the place, and gives general ſatisfaction by his exemplary conduct. But ſuch, as he himſelf avowed to our traveller, is his conſtitutional propenſity to thieving, that no ſooner is the term of his impriſonment elapſed, than he returns with redoubled ardour to his lawleſs courſes. It is not ſo much for the ſake of plunder, as to gratify his irreſiſtible impulſe, that he follows this vicious life; and M. Thouin adds, that he recounted his different exploits with as much exultation and triumph as a veteran diſplays when rehearſing his warlike atchievements.

Another ſalutary regulation in this inſtitution, from which the beſt conſequences reſult, is the indulgence granted to the priſoners of receiving the viſits of their wives and miſtreſſes twice every week. Proper care, however, is taken to guard againſt the introduction of diſeaſe; and the ladies, in one ſenſe, purchaſe their admiſſion by giving a trifling ſum of money at the gate, which becomes the perquiſite of the aged priſoners, whoſe wants are of a different nature from their youthful comrades. Thus the pleaſures of one claſs contribute to the comforts of the other; and the entrance money, trifling as it is, keeps away a crowd of idle vagabonds, who have no acquaintance with the priſoners. The ladies at their viſits are permitted to eat and drink with their lovers; and when the converſation becomes too animated for a third perſon to be preſent, the reſt of the company obligingly take the hint, and leave them to enjoy a *tete a-tete*.—By this prudent regulation, many hurtful conſequences attendant on a total ſecluſion from female ſociety are guarded againſt.

M. Thouin concludes his account with obſerving, that the raſping-houſe at Amſterdam bears a greater reſemblance to a well-ordered manufactory than to a priſon. It were to be wiſhed, that all ſimilar inſtitutions were conducted upon a ſimilar plan.

But it is probable that ſolitary confinement and leſs intercourſe with their friends would have a better effect in reforming the habits of offenders than the indulgences which M. Thouin conſiders as ſo beneficial. The philoſopher whom we formerly quoted obſerves, that "of reforming puniſhments none promiſes ſo much ſucceſs as that of ſolitary impriſonment, or the confinement of criminals in ſeparate apartments. This improvement of the Amſterdam houſe of correction would augment the terror of the puniſhment, would ſeclude the criminal from the ſociety of his fellow-priſoners, in which ſociety the worſe are ſure to corrupt the better; would wean him from the knowledge of his companions, and from the love of that turbulent pernicious life in which his vices had engaged him; would raiſe up in him reflections on the folly of his choice, and diſpoſe his mind to ſuch bitter and continued penitence, as might produce a laſting alteration in the principles of his conduct."

In addition to the confinement and labour which offenders undergo in houſes of correction, ſome are ſubjected to whipping at certain ſtated intervals. The benefit ariſing from this mode of puniſhment, with regard to the reformation of the criminal, has been juſtly queſtioned. If any good effect is to be expected from this diſcipline, it muſt be inflicted in private. It has been obſerved by one * who knew human nature well, that puniſhment which deprives a man of all ſenſe of honour will never contribute to make him virtuous; and it is generally found that the ſoldier who has once been whipped, becomes quite indifferent to propriety of conduct. Faſting, which is not attended with ſhame, promiſes to be a more effectual puniſhment of profligacy.

CORRECTOR, in general, denotes ſomething that mends the faults or bad qualities of others.

Corrector of the Staple, a clerk belonging to the ſtaple, whoſe buſineſs is to write down and record the bargains that merchants make there.

Corrector, in *Medicine* or *Pharmacy*, an ingredient in a compoſition, which guards againſt or abates the force of another.

CORREGIDOR, the name of an officer of juſtice in Spain, and countries ſubject to the Spaniſh government. He is the chief judge of a town or province.

CORREGIO. See Allegri.

CORRELATIVE, ſomething oppoſed to another in a certain relation. Thus father and ſon are correlatives. Light and darkneſs, motion and reſt, are correlative and oppoſite terms.

CORRIGIOLA, in *Botany*, a genus of plants belonging to the pentandria claſs, and in the natural method ranking under the 45th order, *Miſcellaneæ*. See Botany *Index*.

CORROBORANTS, or Corroborative *Medicines*. See Strengtheners.

CORROSION, in a general ſenſe, the action of gnawing away, by degrees, the continuity of the parts of bodies.

Corrosion, in *Chemiſtry*, an action of bodies, by means of proper menſtruums, that produces new com-

* *Fielding*.

binations, and a change of their form, without converting them to fluidity.

CORROSIVE SUBLIMATE MERCURY. See CHEMISTRY *Index*.

CORRUGATOR MUSCLE. See ANATOMY, *Table of the Muſcles*.

CORROSIVES, in *Surgery*, are medicines which corrode whatever part of the body they are applied to. Such are burnt alum, white precipitate of mercury, white vitriol, red precipitate of mercury, butter of antimony, lapis infernalis, &c.

CORRUPTICOLÆ, a ſect who roſe out of the Monophyſites in Egypt about the year 519, under their chief Severus, the pretended patriarch of Alexandria.

Their diſtinguiſhing doctrine, whence they derived their name, was, that the body of Jeſus Chriſt was *corruptible;* that the fathers had owned it; and that to deny it was to deny the truth of our Saviour's paſſion.

On the other hand, Julian of Halicarnaſſus, another Eutychian, a refugee, as well as Severus, in Alexandria, maintained that the body of Jeſus Chriſt had been always incorruptible; that to ſay it was corruptible, was to make a diſtinction between Jeſus Chriſt and the Word, and by conſequence to make two natures in Jeſus Chriſt.

The people of Alexandria were divided between the two opinions; and the partiſans of Severus were called *corrupticolæ*, q. d. worſhippers of ſomething *corruptible:* ſometimes they were denominated *corruptibiles;* and the adherents of Julian *incorruptibiles* or *phantaſiaſtæ*. The clergy and ſecular powers favoured the firſt; the monks and the people the latter.

CORRUPTION, the deſtruction, extinction, or at leaſt ceſſation for a time, of the proper mode of exiſtence of any natural body. See PUTREFACTION.

Corruption of Blood, in *Law*, one of the conſequences of an attainder; and is both upwards and downwards; ſo that an attainted perſon can neither inherit lands or other hereditaments from his anceſtors, nor retain thoſe he is already in poſſeſſion of, nor tranſmit them by deſcent to any heir; but the ſame ſhall eſcheat to the lord of the fee, ſubject to the king's ſuperior right of forfeiture; and the perſon attainted ſhall alſo obſtruct all deſcents to his poſterity, wherever they are obliged to derive a title through him to a remoter anceſtor. See ATTAINDER.

Blackſt. Comment.

This is one of thoſe notions which our laws have adopted from the feudal conſtitutions, at the time of the Norman conqueſt; as appears from its being unknown in thoſe tenures which are indiſputably Saxon, or gavel kind: wherein though by treaſon, according to the ancient Saxon laws, the land is forfeited to the king, yet no corruption of blood, no impediment of deſcents, enſues; and on judgment of mere felony, no eſcheat accrues to the lord. But by the law of England, derived as above, a man's blood is ſo univerſally corrupted by attainder, that his ſons can neither inherit to him nor to any other anceſtor, at leaſt on the part of their attainted father.

This corruption of blood cannot be abſolutely removed but by authority of parliament. The king may excuſe the public puniſhment of an offender; but cannot aboliſh the private right which has accrued, or may accrue, to individuals as a conſequence of the criminal's attainder. He may remit a forfeiture in which the intereſt of the crown is alone concerned; but he cannot wipe away the corruption of blood; for therein a third perſon hath an intereſt, the lord who claims by eſcheat. If therefore a man hath a ſon, and is attainted, and afterwards pardoned by the king: this ſon can never inherit to his father, or father's anceſtors; becauſe his paternal blood, being once thoroughly corrupted by his father's attainder, muſt continue ſo: but if the ſon had been born after the pardon, he might inherit; becauſe, by the pardon, the father is made a new man, and may convey new inheritable blood to his after-born children.

This corruption of blood, thus ariſing from feudal principles, but perhaps extended farther than even theſe principles will warrant, has been long looked upon as a peculiar hardſhip: becauſe the oppreſſive parts of the feudal tenures being now in general aboliſhed, it ſeems unreaſonable to reſerve one of their moſt inequitable conſequences; namely, that the children ſhould not only be reduced to preſent poverty (which, however ſevere, is ſufficiently juſtified upon reaſons of public policy), but alſo be laid under future difficulties of inheritance, on account of the guilt of their anceſtors. And therefore in moſt (if not all) of the new felonies treated by parliament ſince the reign of Henry VIII. it is declared that they ſhall not extend to any corruption of blood: and by the ſtatute 7 Anne, c. 21. (the operation of which is poſtponed by the ſtatute 17 Geo. II. c. 39.) it is enacted, that after the death of the late pretender and his ſons, no attainder for treaſon ſhall extend to the diſinheriting any heir, nor the prejudice of any perſon, other than the offender himſelf; which proviſions have indeed carried the remedy farther than was required by the hardſhip above complained of; which is only the future obſtruction of deſcents, where the pedigree happens to be deduced through the blood of an attainted anceſtor.

CORSAIR, a pirate or perſon who ſcours the ſeas, eſpecially the Mediterranean, with a veſſel armed for war, without commiſſion from any prince or power, to plunder merchant veſſels. The word comes from the Italian *corſare*, of *corſo*, or *à curſibus*, by reaſon of their courſes, or excurſions.—The name is commonly given to the piratical cruiſers of Barbary, who had their riſe about the beginning of the 16th century.

A *corſair* is diſtinguiſhed from a *privateer* in this, that the latter does it under a commiſſion, and only attacks the veſſels of thoſe at war with the ſtate whence his commiſſion is derived. The puniſhment of a corſair is to be hanged, without remiſſion; whereas privateers are to be treated as priſoners of war. All corſair veſſels are good prizes.

CORSELET, a little cuiraſs: or, according to others, an armour or coat made to cover the whole body, anciently worn by the pikemen, uſually placed in the front and flanks of the battle, for the better reſiſting the enemy's aſſaults, and guarding the ſoldiers placed behind them.

CORSICA, an iſland in the Mediterranean, between 8° and 10° E. Long. and 41° and 43° N. Lat. On the ſouth it is ſeparated from Sardinia, by the ſtrait of Bonifacio; to the eaſt it has the Tuſcan ſea; to the north the gulf of Genoa; and to the weſt it is oppoſite the coaſts of France and Spain. It is 150 miles from north to ſouth, and from 40 to 50 in breadth. It was known to the ancient Greeks by the names of Calliſta and Cyrnus, and to the Romans by its preſent appellation. On the coaſt are many excellent harbours. It is mountainous, but fruitful valleys are interſperſed; and it has ſome fine lakes and rivers. With reſpect to products, Corſica has nothing peculiar to itſelf; but from the earlieſt times it has been famous for its ſwarms of bees, and produces vaſt quantities of honey, which, however, is reckoned bitter, on account of the box and yew with which the country abounds. The mountains are rich in lead, iron, copper, and ſilver; a mine of the latter was opened in the year 1767, from which a quintal of mineral produced 18 ounces of ſilver. There are alſo mines of alum and ſaltpetre. The granite of Corſica is nearly equal to the oriental. Porphyries, jaſper, talc, amianthus, emeralds, and other precious ſtones, are found ſcattered in the mountains; and the ſouth coaſt abounds with beautiful coral. After many revolutions, this iſland was, for ſome centuries, under the dominion of the Genoeſe, whoſe tyranny was ſuch, that the Corſicans were almoſt in a perpetual ſtate of inſurrection. In 1736, a German adventurer, Theodore baron Newhoff, brought ſome aſſiſtance to them, and, on his aſſurances of more powerful aid, they elected him king; but, as he could not ſubſtantiate his promiſes, he was obliged to leave the iſland. He came to England, was thrown into the Fleet priſon, releaſed by an act of inſolvency (after having regiſtered his kingdom of Corſica for the benefit of his creditors), and ſuffered to die in extreme indigence. The Genoeſe tired of the conteſt, ſold the ſovereignty to France, in 1767, and the celebrated Paoli, who had been elected to the chief command, in 1755, was obliged to abandon the iſland in 1769. After the French revolution, in 1789, Corſica was admitted as an eighty-third department of France, at the particular requeſt of a deputation, of which Paoli was at the head. In conſequence, however, of ſome events which followed the revolution of 1792, Paoli revolted; the French, by the aſſiſtance of the Engliſh, were expelled from the iſland; and Corſica, on the 19th of June 1794, was declared annexed to the crown of Great Britain, according to a new conſtitution, which had been previouſly formed. In October 1796, however, the Engliſh found it expedient to evacuate the iſland, of which the French immediately took poſſeſſion, and again united it to their republic, dividing it into two departments, Golo and Liamone; of the former of which Baſtia is the chief town, and of the latter Ajaccio.

CORSNED, or Morsel of Execration, a ſpecies of trial or purgation * anciently in uſe among us, and which probably aroſe from an abuſe of revelation in the dark ages of ſuperſtition. It conſiſted of a piece of cheeſe or bread, about an ounce in weight, which was conſecrated with a form of exorciſm; deſiring of the Almighty that it might cauſe convulſions and paleneſs, and find no paſſage if the man was really guilty; but might turn to health and nouriſhment if he was innocent; as the water of jealouſy among the Jews was, by God's eſpecial appointment, to cauſe the belly to ſwell, and the thigh to rot, if the woman was guilty of adultery. This corſned was then given to the ſuſpected perſon, who at the ſame time alſo received the holy ſacrament: if indeed the corſned was not, as ſome have ſuſpected, the ſacramental bread itſelf: till the ſubſequent invention of tranſubſtantiation preſerved it from profane uſes with a more profound reſpect than formerly. Our hiſtorians aſſure us, that Godwin, earl of Kent, in the reign of King Edward the Confeſſor, abjuring the death of the king's brother, at laſt appealed to his corſned, "per *buccellam deglutiendam abjuravit*," which ſtuck in his throat and killed him. This cuſtom has been long ſince gradually aboliſhed, though the remembrance of it ſtill ſubſiſts in certain phraſes of abjuration retained among the common people: as, "I will take the ſacrament upon it; May this morſel be my laſt;" and the like.

* See *Trial*.

CORT, Cornelius, a celebrated engraver, was born at Hoorn in Holland in 1536. After having learned the firſt principles of drawing and engraving, he went to Italy to complete his ſtudies, and viſited all the places famous for the works of the great maſters. At Venice he was courteouſly received by Titian; and engraved ſeveral plates from the pictures of that admirable painter. He at laſt ſettled at Rome, where he died in 1578, aged 42. According to Baſan, he was "the beſt engraver with the burin or graver only that Holland ever produced. We find in his prints," adds he, "correctneſs of drawing, and an exquiſite taſte." He praiſes alſo the taſte and lightneſs of touch with which he engraved landſcapes, and that without the aſſiſtance of the point. It is no ſmall honour to this artiſt, that Agoſtino Carracci was his ſcholar, and imitated his ſtyle of engraving rather than that of any other maſter. His engravings are very numerous (151 according to Abbé Marolles), and by no means uncommon.

CORTES *of* Spain, a term purely Spaniſh, ſignifying the *courts*, i. e. the ſtates or aſſembly of the ſtates, at Madrid.

Cortes, or Cortez, *Ferdinand*, a Spaniſh general, famous for the conqueſt of Mexico, and other victories over the natives of South America; but infamous for the cruelties he committed upon the vanquiſhed, without regard to rank, age, or ſex. It probably was on this account he was but coolly received on his return to Europe by his royal maſter Charles V.: It is even aſſerted that the emperor aſked him who he was? to which Cortez replied; "I am the man who gave you more provinces than your anceſtors have left you towns." Died in 1554, aged 63. See Mexico.

CORTEX, in *Botany*, the rind or coarſe outer bark of plants. The organization of the outer and inner barks, which differ principally in the fineneſs of their texture, is particularly explained under the article Plants.

Wounds of the bark, and its ſeparations from the wood, whether naturally or artificially made, are eaſily cured, and made to unite again by proper care. If ſections be made in the rinds of the aſh and ſycamore of a ſquare figure, three ſides cut, and the fourth uncut, and the whole be afterwards bound round with a pack-thread, it will all unite again, only leaving a ſcar in each of the three ſides where it was cut. If ſeveral parts of the bark of either of theſe trees be cut off, and entirely ſeparated from the tree; ſome ſhallower, leaving a part of the bark on, and others deeper, to the wood itſelf; theſe pieces being again put into their places, and bound on with a pack-thread, will not indeed unite, but a freſh bark will grow in their places, and thruſt them away; but if they be firſt carefully laid on in the exact direction in which they originally grew, and then the whole part beyond the wound on every ſide covered with a large plaſter of diachylon, or the like, and this bound over with pack-thread to keep all firmly in their places, the pieces of bark, whether cut off ſhallow or deep down to the very wood of the tree, will firmly unite themſelves to the places where they originally grew. This cure will be performed in about three weeks; but the outer rind of the ſeparated pieces will not be plump, but ſomewhat ſhrivelled; the edges alſo will recede ſomewhat from their original place; ſo that there remains a ſort of ſcar all round. Theſe experiments are beſt made in the ſpring ſeaſon; for in the autumn and winter, the ſap ariſing but weakly, the parts that ſhould unite wither before that is brought about. The ſucceſs of theſe experiments has made ſome think that the whole branch of a tree ſeparated and bound on again might unite with the reſt. But the experiments that have been made in the moſt favourable manner for ſuch a trial have all proved vain, the branch cut off withering always in a few days, however well united and carefully kept on.

CORTEX *Peruvianus.* See CINCHONA, BOTANY *Index.*

CORTEX *Winteranus.* See WINTERA, BOTANY *Index.*

CORTONA, PIETRO DA. See BERRETINI.

CORTONA, a very ancient town of Italy, mentioned by many of the Roman hiſtorians. It was originally called *Corton*, and lay to the northward of the lake Thraſymenus. It ſtill remains the name of Cortona. E. Long. 13. 0. N. Lat 43. 15.

CORTONESE, PIETRO PALO. See GOBBO.

CORTUSA, BEAR'S-EAR SANICLE; a genus of plants, belonging to the pentandria claſs; and in the natural method ranking under the 21ſt order, *Preciæ.* See BOTANY *Index.*

CORUNNA, or GROYNE, a port-town of Gallicia in Spain, ſituated on a fine bay of the Atlantic ocean, about 32 miles north of Compoſtella, and 20 ſouth-weſt of Ferrol. W. Long. 9. 0. N. Lat. 43. 0.

CORUS, OMER, HOMER, or CHOMER, in the Jewiſh antiquities, a meaſure containing 10 baths or 75 gallons and five pints, as a meaſure of things liquid, and 32 pecks and 1 pint as a meaſure for things dry. The *corus* or *omer* was moſt commonly a meaſure for things dry; and the greateſt that was uſed among the Jews. It contained, according to the rabbins, 10 ephahs or 30 ſata or ſeahs. *Corus* is the moſt uſual term in the hiſtorical writers, and *omer* or *chomer* among the prophets.

CORUS is alſo uſed in ſome of our old writers for eight buſhels or a quarter; *decem* coros *tritici, ſive decem quarteria.*

CORUSCATION, a glittering or gleam of light iſſuing from any thing. It is chiefly uſed for a flaſh of lightning darting from the clouds in time of thunder.

There is a method of producing artificial coruſcations, or ſparkling fiery meteors, which will be viſible not only in the dark but at noon-day, and that from two liquors actually cold. The method is this. Fifteen grains of ſolid phoſphorus are to be melted in about a drachm of water; when this is cold, pour upon it about two ounces of oil of vitriol; let theſe be ſhaken together, and they will at firſt heat, and afterwards they will throw up fiery balls in great number, which will adhere like ſo many ſtars to the ſides of the glaſs, and continue burning a conſiderable time; after this, if a ſmall quantity of oil of turpentine is poured in, without ſhaking the phial, the mixture will of itſelf take fire, and burn very furiouſly. The veſſel ſhould be large, and open at the top.

Artificial coruſcations may alſo be produced by means of oil of vitriol and iron, in the following manner: Take a glaſs body capable of holding three quarts; put into this three ounces of oil of vitriol and twelve ounces of water; then warming the mixture a little, throw in, at ſeveral times, two ounces or more of clean iron filings; upon this an ebullition and white vapours will ariſe: then preſent a lighted candle to the mouth of the veſſel, and the vapour will take fire, and afford a bright fulmination or flaſh like lightning. Applying the candle in this manner ſeveral times, the effect will always be the ſame; and ſometimes the fire will fill the whole body of the glaſs, and even circulate to the bottom of the liquor; at others, it will only reach a little way down its neck. The great caution to be uſed in making this experiment is the making the vapour of a proper heat: for, if too cold, few vapours will ariſe; and, if made too hot, they will ariſe too faſt, and will only take fire in the neck of the glaſs, without any remarkable coruſcation.

CORVORANT, formerly written CORMORANT. See PELICANUS, ORNITHOLOGY *Index.*

CORVUS, the RAVEN or CROW kind, a genus of birds of the order of picæ. See ORNITHOLOGY *Index.*

CORVUS (*Raven*), in *Aſtronomy*, a conſtellation of the ſouthern hemiſphere; whoſe ſtars in Ptolemy's catalogue are 7; in Tycho's as many; in the Britannic catalogue 9.

CORVUS, in Roman antiquity, a military engine, or rather gallery, moveable at pleaſure by means of pulleys; chiefly uſed in boarding the enemy's ſhips to cover the men. The conſtruction of the corvus was as follows: They erected on the prow of their veſſels a round piece of timber of about a foot and a half diameter, and about 12 feet long; on the top of which they had a block or pulley. Round this piece of timber they laid a ſtage or platform of boards, four feet broad, and about 18 feet long, which was well framed and faſtened with iron. The entrance was long-ways, and it moved about on the above-mentioned upright piece of timber as on a ſpindle, and could be hoiſted up within ſix feet of the top: about this was a ſort of parapet knee-high, which was defended with upright bars of iron ſharpened at the end, and towards the top there was a ring, by the help of which and a pulley or tackle, they raiſed or lowered the engine at pleaſure. With this moveable gallery they boarded the enemy's veſſels (when they did not oppoſe ſide to ſide),

ſide), ſometimes on their bow and ſometimes on their ſtern, as occaſion beſt ſerved. When they had grappled the enemy with theſe iron ſpikes, if they happened to ſwing broadſide to broadſide, then they entered from all parts; but in caſe they attacked them on the bow, they entered two and two by the help of this machine, the foremoſt defending the foreparts, and thoſe that followed the flanks, keeping the boſs of their bucklers level with the top of the parapet.

CORYATE, Thomas, a very extraordinary perſonage, who ſeems to have made himſelf famous by his whimſical extravagancies, was the ſon of a clergyman, and born at Oldcombe in Somerſetſhire in 1577. He acquired Greek and Latin at Oxford; and coming to London, was received into the houſehold of Henry prince of Wales. If Coryate was not over witty himſelf, he got acquainted with the wits of that time, and ſerved to exerciſe their abilities, having more learning than judgment. He was a great peripatetic: for, in 1608, he took a long journey on foot; and after he returned, publiſhed his travels under the following ſtrange title: *Crudities haſtily gobbled up in five months Travels in France, Savoy, Italy, Rhetia, Helvetia, ſome parts of High Germany, and the Netherlands*, Lond. 1611, 4to. In 1612 he ſet out again with a reſolution to ſpend ten years in travelling: he went firſt to Conſtantinople; and after travelling over a great part of the Eaſt, died of a flux at Surat in the Eaſt Indies. Some of the accounts of his peregrinations are to be found in Purchas's Pilgrimages.

CORYBANTES, in antiquity, prieſts of Cybele, who danced and capered to the ſound of flutes and drums. See Crotalum.

Catullus, in his poem called *Atys*, gives a beautiful deſcription of them, repreſenting them as madmen. Accordingly Maximus Tyrius ſays, that thoſe poſſeſſed with the ſpirit of Corybantes, as ſoon as they heard the ſound of a flute, were ſeized with an enthuſiaſm, and loſt the uſe of their reaſon. And hence the Greeks uſe the word κοϱυβαντειν, *to corobantize*, to ſignify a perſon's being tranſported or poſſeſſed with a devil. See Enthusiasm.

Some ſay that the Corybantes were all eunuchs; and that it is on this account Catullus, in his Atys, always uſes feminine epithets and relatives in ſpeaking of them.

Diodorus Siculus remarks, that Corybas, ſon of Jaſon and Cybele, paſſing into Phrygia with his uncle Dardanus, there inſtituted the worſhip of the mother of the gods, and gave his own name to the prieſts. Strabo relates it as the opinion of ſome, that the Corybantes were children of Jupiter and Calliope, and the ſame with the *Cabiri*. Others ſay the word had its origin from this, that the Corybantes always walked dancing (if the expreſſion may be allowed) or toſſing the head, κοϱυπτοντες βαινοειν.

CORYBANTICA, a feſtival held in Crete, in memory of the Corybantes, who educated Jupiter when he was concealed in that iſland from his father Saturn, who would have devoured him.

CORYCEUM, in antiquity, that part of the gymnaſium where people undreſſed. It was otherwiſe called *apodyterion*.

CORYCOMACHIA, among the ancients, was a ſort of exerciſe in which they puſhed forwards a ball, ſuſpended from the ceiling, and at its return either caught it with their hands, or ſuffered it to meet their body. Oribaſius informs us it was recommended for extenuating too groſs bodies.

CORYDALES, in *Botany*, an order of plants in the *Fragmenta Methodi Naturalis* of Linnæus, containing the following genera, viz. epimedium, hypecoum, leontice, melianthus, pinguicula, and utricularia.

CORYDALIS, in *Botany*. See Fumaria, Botany *Index*.

CORYLUS, the Hazel; a genus of plants belonging to the monœcia claſs; and in the natural method ranking under the 50th order, *Amentaceæ*. See Botany *Index*.

CORYMBIFERÆ, in *Botany*, the name of an order or diviſion of the compound flowers adopted by Linnæus after Ray and Vaillant, in the former editions of his Fragments of a Natural Method. This title in the later editions is changed for *Diſcoideæ*, another name borrowed from Ray's Method, but uſed in a ſomewhat different ſenſe.

CORYMBIUM, in antiquity, an ornament of hair worn by the women. Its form was that of a corymbus.

Corymbium; a genus of plants belonging to the ſyngeneſia claſs; and in the natural method ranking under the 49th order, *Compoſitæ*. See Botany *Index*. —The calyx is diphyllous, uniflorous, and priſmatical; the corolla monopetalous and regular; there is one woolly ſeed below each floret.

CORYMBUS, properly ſignifies a cluſter of ivy berries. Among botaniſts, it is a mode of flowering in which the leſſer or partial flower ſtalks are produced along the common ſtalk on both ſides; and though of unequal lengths, riſe to the ſame height, ſo as to form a flat and even ſurface at the top. See Botany *Index*.

CORYNOCARPUS, in *Botany*; a genus of plants belonging to the pentandria claſs. See Botany *Index*.

CORYPHA, Mountain Palm, or *Umbrella Tree*; a genus of plants of the order of *Palmæ*, belonging to the monœcia claſs. See Botany *Index*.

CORYPHÆNA, a genus of fiſhes belonging to the order of thoracici. See Ichthyology *Index*.

CORYPHÆUS, in the ancient tragedy, was the chief or leader of the company that compoſed the chorus: (ſee Chorus).—The word is formed from the Greek κοϱυφη, "tip of the head." The coryphæus ſpoke for all the reſt, whenever the chorus took part in the action, in quality of a perſon of the drama, during the courſe of the acts. Hence coryphæus had paſſed into a general name for the chief or principal of any company, corporation, ſect, opinion, &c. Thus Euſtatius of Antioch is called the *coryphæus* of the council of Nice; and Cicero calls Zeno the *coryphæus* of the ſtoics.

CORYVREKAN, a dangerous whirlpool on the weſt coaſt of Scotland, between the iſle of Scarba and the north point of that Jura. It is ſo named from a young Daniſh prince, who periſhed in this place: its dreadful vortex extends above a mile in circuit. Many ſmaller whirlpools and rapid currents are found in this neighbourhood; dangerous to thoſe who are ſtrangers to the coaſt.

CORYZA, in *Medicine*, a catarrh of the noſe. See MEDICINE *Index*.

CORZOLA, or CURSCOLA, an iſland in the gulf of Venice, divided from Raguſa in Dalmatia by a narrow ſtrait. E. Long. 18. 0. N. Lat. 42. 35.

COS, or COOS, in *Ancient Geography*, a noble iſland on the coaſt of Caria, in the Hither Aſia, 15 miles to the weſt of Halicarnaſſus, 100 in compaſs, called *Meropis;* and hence Thucydides joins both names together, *Cos Meropis;* it had a cognominal town *Cos*, but originally called *Aſtypalæa*, mentioned by Homer; with a port locked or walled round, (Scylax, Mela). The iſland was fruitful, and yielded a generous wine, (Strabo). It boaſted of Hippocrates and Apelles; each at the head of his ſeveral profeſſion. It was the country of Philetas, an excellent elegiac poet, who flouriſhed in the time of Philip and Alexander: the preceptor of Ptolemy Philadelphus: ſo thin and light that he was obliged to wear lead to prevent the being blown away by a puff of wind (Ælian, Athenæus); much commended by Propertius. The *veſtes Coæ*, made of ſilk, were famous for their fineneſs and colour, (Horace, Propertius, Tibullus). In the ſuburbs of Cos ſtood the temple of Æſculapius, a noble ſtructure, and extremely rich.

Cos, the *Whetſtone*, in *Natural Hiſtory*, a genus of vitreſcent ſtones, conſiſting of fragments of an indeterminate figure, ſub-opaque, and granulated.

Of this genus there are ſeveral ſpecies, ſome conſiſting of rougher, and others of ſmoother, or even of altogether impalpable particles; and uſed not only for whetſtones, but alſo for mill-ſtones, and other the like purpoſes.

Cos TURCICA, *Turkey-ſtone*, a ſpecies of ſtones of the garnet kind, belonging to the ſiliceous claſs. It is of a dull white, and often of an unequal colour; ſome parts appearing more compact than others. Its ſpecific gravity is 2.598: it ſtrikes fire with ſteel, and efferveſces with acids. Mr Kirwan found that 100 parts of it contain 25 of carbonate of lime, and no iron. Cronſtedt is of opinion that there are probably two ſorts of ſtones known by this name, as that deſcribed by Wallerius neither gives fire with ſteel nor efferveſces with acids. It is uſed as a whetſtone; and thoſe of the fineſt grain are the beſt hones for the moſt delicate cutting tools, and even for razors, lancets, &c.

COSCINOMANCY, the art of divination by means of a ſieve. The word comes from κοσκινον, *cribrum*, "a ſieve," and μαντεια, *divination*. The ſieve being ſuſpended, after rehearſing a formula of words, it is taken between two fingers only; and the names of the parties ſuſpected repeated: he at whoſe name the ſieve turns, trembles, or ſhakes, is reputed guilty of the evil in queſtion.

This muſt be a very ancient practice: Theocritus, in his third Idyllion, mentions a woman very ſkilful in it. It was ſometimes alſo practiſed by ſuſpending the ſieve by a thread, or fixing it to the points of a pair of ſheers, giving it room to turn, and naming, as before, the parties ſuſpected; in which laſt manner *coſcinomancy* is ſtill practiſed in ſome parts of England. It appears from Theocritus, that it was not only uſed to find out perſons unknown, but alſo to diſcover the ſecrets of thoſe that were known.

CO-SECANT, in *Geometry*, the ſecant of an arch which is the complement of another to 90°. See GEOMETRY.

COSENAGE, in *Law*, a writ that lies where the treſail, that is, the tritavus, the father of the beſail, or great grandfather, being ſeized in fee at his death of certain lands or tenements, dies; a ſtranger enters, and abates; then ſhall his heir have this writ of coſenage; the form of which ſee in Fitz. Nat. Br. fol. 221.

COSENING, in *Law*, an offence whereby any thing is done deceitfully, in or out of contracts, which cannot be fitly termed by any eſpecial name. In the civil law it is called *ſtellionatus*. See STELLIONATE.

COSENZA, the capital of the Hither Calabria, in the kingdom of Naples. E. Long. 16. 35. N. Lat. 39. 15. It is an archbiſhop's ſee.

COSHERING, in the feudal cuſtoms, a kind of right of the lords to lie and feaſt themſelves and their followers at their tenants houſes. The word *coſhering* may perhaps be derived from the old Engliſh word *coſhe*, a cot or cottage.

CO-SINE, in *Trigonometry*, the ſine of an arch which is the complement of another to 90°. See GEOMETRY.

COSMETIC, in *Phyſic*, any medicine or preparation which renders the ſkin ſoft and white, or helps to beautify and improve the complexion; as lip-ſalves, cold creams, ceruſe, &c.

COSMICAL, a term in *Aſtronomy*, expreſſing one of the poetical riſings of a ſtar: thus a ſtar is ſaid to riſe coſmically when it riſes with the ſun, or with that point of the ecliptic in which the ſun is at that time; and the coſmical ſetting is when a ſtar ſets in the weſt at the ſame time that the ſun riſes in the eaſt.

COSMOGONY, in *Phyſics*, ſignifies the ſcience of the formation of the univerſe. It is formed of κοσμος, *the world*, and γινομαι, *I am born*.

In our conjectures about the formation of the world there are two principles which we ought never to loſe ſight of: 1. That of *creation;* for certainly matter could not give itſelf exiſtence, it muſt have received it. 2. That of a *Supreme Intelligence* directing this creation, and the arrangement of the parts of matter, in conſequence of which this world was formed. See CREATION and GEOLOGY.

COSMOGRAPHY, the deſcription of the world; or the art which teaches the conſtruction, figure, diſpoſition, and relation of all the parts of the world, with the manner of repreſenting them on a plane. The word comes from κοσμος, *world*, and γραφω, *I deſcribe*.

Coſmography conſiſts chiefly of two parts: *Aſtronomy*, which ſhows the ſtructure of the heavens, and the diſpoſition of the ſtars; and *Geography*, which ſhows thoſe of the earth.

COSMOLABE (from κοσμος, *world*, and λαμβανω, *I take*), an ancient mathematical inſtrument, ſerving to meaſure diſtances both in the heavens and on earth. The *Coſmolabe* is in a great meaſure the ſame with the aſtrolabe. It is alſo called *pantacoſm*, or the *univerſal inſtrument*, by L. Morgard, in a treatiſe written expreſsly upon it, printed in 1612.

COSMOLOGY (from κοσμος, *world*, and λογος, *diſcourſe*), the ſcience of the world in general. This Wolfius calls *general*, or *tranſcendental coſmology*, and has written a treatiſe on the ſubject, wherein he endeavours to explain how the world ariſes from ſimple ſubſtances; and treats of the general principles, of the modifications of material things, of the elements of bodies, of the laws of the motion, of the perfection of the world, and of the order and courſe of nature.

COSMOPOLITE, or COSMOPOLITAN, a term ſometimes uſed to ſignify a perſon who has no fixed living or place of abode, or a man who is a ſtranger nowhere. The word comes from the Greek κοσμος, *world*, and πολις, *city*.—One of the ancient philoſophers being interrogated what countryman he was? anſwered, he was a *coſmopolite*, i. e. an inhabitant or citizen of the world.

COSSACKS, a name given to the people inhabiting the banks of the rivers Dnieper and Don, near the Black ſea and borders of Turkey. The word implies irregular troops of horſe. Theſe people are divided into European and Aſiatic Coſſacks. The firſt conſiſt of the Zaporog, who dwell below the cataract of the Dnieper, ſome on the ſide next to Ruſſia, and others on the oppoſite ſide of the river; the Lower and Upper Coſſacks; the Bielgorod Coſſacks; and a part of the Don Coſſacks. The Aſiatic Coſſacks are compoſed of the reſt of the Don Coſſacks, the Grebin Coſſacks, the Yaik Coſſacks, and the Weſtern Calmucks, who retiring from thoſe that inhabited the ſouth borders of Siberia under Yaiuki Can, ſettled upon the Wolga, and are dependent upon Ruſſia.

The Coſſacks were known by that name ever ſince the 948th year of Chriſt. They dwelt upon Mount Caucaſus, in the place now called *Cabardy;* and were reduced under the Ruſſian dominion by Prince Mſtiſlaw in the year 1021. Many Ruſſians, Poles, and others, who could not live at home, have, at different times been admitted among the Coſſacks: but the latter, abſtracted from theſe fugitives, muſt have been an ancient and well governed nation.

Toward the beginning of the 16th century, the Zaporog Coſſacks fixed their habitations on the ſpacious plains that extend along the banks of the Dnieper. They had undergone conſiderable hardſhips from the incurſions of the Tartars, for which they afterwards founds means to avenge themſelves in an ample manner. The Poles being ſenſible how ſerviceable the Coſſacks might be in defending them from the ravages of the Tartars, and even the Ruſſians, propoſed to them terms of alliance. In 1562, they ſolemnly took them under their protection, and engaged to pay them an annual ſubſidy; in return for which the Coſſacks were to keep on foot a ſufficient body of troops for the defence of the Poliſh dominions. With a view to bind them ſtill more ſtrongly by ties of intereſt, the Poles gave them the whole country between the rivers Dnieper and Neiſter, and the borders of Tartary. The Coſſacks applied themſelves with great induſtry to the cultivation of this fertile ſpot; ſo that in a ſhort time it was interſperſed with large towns and handſome villages. Beſides, they continually haraſſed the Turks, and did them great damage by their incurſions; and, in order to prevent the latter from purſuing them, or making repriſals, they poſſeſſed themſelves of ſeveral ſmall iſlands in the Dnieper, where they kept their magazines, &c. The hettman or general of the Coſſacks was not in the leaſt ſubordinate to the field marſhal of Poland; but acted in concert with him as an ally, and not as a ſubject of that republic. But this alliance, though of ſuch manifeſt advantage to both parties, was not of long duration. The Poles, ſeeing the vaſt improvements made by the Coſſacks in the country they had given up to them, became envious of them, and actually made an attempt to bring them into ſubjection, as we have ſeen in the hiſtory of Poland. In 1648 the Coſſacks gained great advantages over them, and next year came to an accommodation, in which they not only preſerved their old immunities, but obtained additional privileges. The reſult of all was, that theſe Coſſacks remained under the protection of Ruſſia; and as their former country was entirely laid waſte in the late wars, they ſettled in the Ruſſian Ukraine, upon receiving formal aſſurances from the court of Ruſſia, that no alteration ſhould be made in their political conſtitution, and that no taxes whatever ſhould be laid upon them. The Coſſacks, on the other hand, were always to keep in readineſs a good body of troops for the ſervice of Ruſſia: but in the year 1708 Mazeppa, their hettman or chief, went over from the Ruſſians to the Swedes; upon which Peter I. reſolved to prevent ſuch revolts for the future. To this end, after the battle of Pultowa, he ſent a ſtrong detachment into the above mentioned little iſlands in the Dnieper, whither the Coſſacks had fled with their wives and children, and all their effects; and ordered them all to be put to the ſword without diſtinction, and the plunder to be divided among his ſoldiers. He likewiſe ſent a great number of men into their country, and cauſed ſeveral thouſands of the Coſſacks to be carried to the coaſts of the Baltic, where they were put to all ſorts of hard labour; by which means he in a manner extirpated the whole nation.

What diſtinguiſhes the Zaporog Coſſacks from all other people is, that they never ſuffer any women in their ſettlements, as the Amazons are ſaid not to have ſuffered any men among them. The women of theſe Coſſacks live in other iſlands of the Dnieper. They never marry, nor have any family: all their male children are enrolled as ſoldiers, and the females are left with their mothers. The brother often has children by his ſiſter, and the father by his daughter. They know no laws but thoſe which cuſtom has introduced, founded on their natural wants; though they have among them ſome prieſts of the Greek perſuaſion. They ſerve in the armies as irregulars; and woe to thoſe who fall into their hands.

The country of theſe Coſſacks, who are an aſſemblage of ancient Roxelans, Sarmatians, and Tartars, is called the *Ocraine* or *Ukraine*. It lies upon the borders of Ruſſia and Poland, Little Tartary, and Turkey, and was anciently a part of Scythia. By virtue of the laſt treaty ſettled between Ruſſia and Poland, in 1693, the latter remains in poſſeſſion of all that part of the Ukraine which is ſituated on the weſt ſide of the Dnieper, and is now but poorly cultivated. That on the eaſt ſide, inhabited by the Coſſacks, is in a much better condition, and extends about two hundred and ſixty miles in length, and as many in breadth. It is one continued fertile plain, watered by a great number of fine rivers, diverſified with pleaſant woods, and yields ſuch plenty of all ſorts of grain, pulſe, tobacco, honey and wax, as to ſupply a great part of the Ruſſian empire with thoſe commodities. Its paſtures are exceeding rich, and its cattle very large; but the inhabitants are greatly plagued by locuſts, which infeſt this fine country. The houſes in the Ukraine are, like thoſe of the Ruſſians, moſtly built with timber.

The Coſſacks are tall and well made, generally hawk-noſed, and of a good mein. They are hardy, vigorous, brave, and extremely jealous of what is moſt valuable in life, their liberty; fickle and wavering, but ſociable, cheerful, and ſprightly. They are a very powerful people, and their forces conſiſt wholly of cavalry.—Their dialect is a compound of the Poliſh and Ruſſian languages; but the latter is the moſt predominant. They were formerly Pagans or Mahometans; but upon their entering into the Poliſh ſervice, they were baptized Chriſtians of the Romiſh communion; and now that they belong to Ruſſia, they profeſs themſelves members of the Greek church.

Each of their towns, with the diſtrict belonging to it, is governed by an officer called *ottomann* or *attamann*.

The Don Coſſacks, ſo called from their reſidence upon the banks of the river Don, greatly reſemble thoſe already deſcribed. In the year 1559, when the Czar Iwan Baſilowitz was emperor of Ruſſia, they voluntarily put themſelves under his protection, and are at this time on a pretty equal footing with the other Ruſſian ſubjects. They have ſeveral towns and villages upon the banks of the Don; but are prevented from extending themſelves farther up the country, by the ſcarcity of freſh water and wood in many places. Their chief ſupport is grazing and agriculture, and occaſionally robbing and plundering, for which they want neither capacity nor inclination. Every town is governed by a magiſtrate called *tamann;* and the tamanns, with their towns, are under the juriſdiction of two ottomanns, who reſide at Tſherkaſky. The troops of theſe Coſſacks likewiſe conſiſt entirely of cavalry. In this country all the towns and villages are fortified and encompaſſed with palliſades, to defend them againſt the incurſions of the Calmucks and Kuban Tartars, with whom they are continually at war. The Coſſacks, in general, are of great ſervice to garriſon towns by way of defence, or to purſue an enemy; but are not ſo good at regular attacks.

The Sietſh Coſſacks, who are alſo called *Haidamacks*, have their particular hettman. They inhabit the Ruſſian, Poliſh, and Turkiſh dominions, along the banks of the Dnieper.

The Yaik Coſſacks dwell on the ſouth ſide of the river Yaik; and upon the ſucceſs of the Ruſſian arms in the kingdom of Aſtracan, voluntarily ſubmitted to them. In ſtature they greatly reſemble the other Coſſacks; though by their booriſh manner of living, and intermarriages with the Tartars, they have not the ſhape and air peculiar to the reſt of their countrymen. Their natural diſpoſitions and cuſtoms are, however, nearly the ſame. Huſbandry, fiſhing, and feeding of cattle, are their principal employments; and, like the other tribes, they let ſlip no opportunity of making depredations on their neighbours. Their continual wars with the Kara Kalpacs and the Kaſatſhaia-Horda oblige them to keep their towns and villages in a ſtate of defence. They are indeed ſubject to Ruſſian waiwodes, to whom they pay an annual tribute in corn, wax, honey, and cattle; but they have alſo their particular chiefs, who govern them according to their ancient cuſtoms. Though the generality of the Yaik Coſſacks profeſs the Greek religion, yet a great many relics of Mahometaniſm and Paganiſm are ſtill found among them. Being naturally bold and hardy, they make excellent ſoldiers; and they are not ſo turbulent as the other Coſſacks. They live entirely at peace with the Calmucks and their other neighbours, and even maintain a commercial intercourſe with them.

COSSE de Geniste, an order of knighthood inſtituted in 1234, by Louis IX. at his marriage with Margaret of Provence. The motto on the collar of this order was, *Exaltat humiles*.

COSSET, among farmers, a colt, calf, or lamb, brought up by hand without the dam.

COSTA, Christopher, a celebrated botaniſt of the 16th century, was born in Africa, of a Portugueſe father, and went into Aſia, to perfect himſelf in the knowledge of ſimples, where he was taken priſoner, but found means to make his eſcape, and after ſeveral voyages, practiſed phyſic at Bourgos. He wrote, 1. A Treatiſe on Indian drugs and medicines. 2. His Voyages to the Indies. 3. A book in praiſe of Women; and other works.

COSTAL, an appellation given by anatomiſts to ſeveral parts belonging to the ſides; thus we meet with coſtal muſcles, vertebræ, &c.

COSTANZO, Angelo di, an Italian hiſtorian and poet, lord of Catulopa, was born in 1507, of a noble and ancient family of Naples, and died about 1591. He wrote, 1. A Hiſtory of Naples, from 1250 to 1489; the beſt edition of which is that of Aquila, in 1582, in folio, very ſcarce. 2. Italian poems, which are eſteemed, and have had ſeveral editions.

COSTA-ricca, a province of North America in New Spain, and in the audience of Guatimala, bounded on the north-eaſt by the Northern ocean, on the ſouth-weſt by the South ſea, on the north-weſt by Nicaragua, and on the ſouth eaſt by Veragua. The ſoil is not very fertile, though there is plenty of cattle. Carthagena is the capital town.

COSTARD, George, a clergyman of the church of England, and author of ſeveral learned works, was born about the year 1710. He was educated at Wadham college, Oxford; and took the degree of M. A. in 1733. The firſt eccleſiaſtical ſituation in which he was placed was that of curate of Iſlip in Oxfordſhire. In 1747 he publiſhed, in 8vo, Some Obſervations tending to illuſtrate the Book of Job. In 1750 he publiſhed Two Diſſertations: I. On the meaning of the word *Keſita*, mentioned in Job, chap. xlii. ver. 11. II. On the Signification of the word *Hermes*. In 1752 he publiſhed in 8vo, at Oxford, *Diſſertationes II. Critico-ſacræ, quarum prima explicatur Ezek*. xiii. 18. *altera vero*, 2 *Reg*. x. 22. In 1755 he wrote a letter to Dr Birch, which is preſerved in the Britiſh Muſeum, reſpecting the meaning of the phraſe *ſphæra barbarica*. Some time after this he undertook to publiſh a ſecond edition of Dr Hyde's *Hiſtoria Religionis veterum Perſarum, eorumque Magorum;* and which was accordingly printed under his inſpection and with his corrections, at the Clarendon

rendon Preſs at Oxford, in 4to. In 1760, Mr Coſtard's extenſive learning having now recommended him to the notice of Lord Chancellor Northington, he obtained, by the favour of that nobleman, in June 1764, the vicarage of Twickenham in Middleſex, in which ſituation he continued till his death. In 1767 he publiſhed, in one volume quarto, The Hiſtory of Aſtronomy, with its application to Geography, Hiſtory, and Chronology; occaſionally exemplified by the Globes. This work was chiefly intended for the uſe of ſtudents, and contains a full and diſtinct view of the ſeveral improvements made in geography and aſtronomy. Mr Coſtard has ſhown, by a gradual deduction, at what time, and by whom, the principal diſcoveries have been made in geography and aſtronomy; how each diſcovery has paved the way to what followed; and by what eaſy ſteps, through the revolution of ſo many ages, theſe very uſeful ſciences have advanced towards their preſent ſtate of perfection. In 1778 he publiſhed, in 8vo, A Letter to Nathaniel Braſſey Halhed, Eſq. containing ſome Remarks on his Preface to the Code of Gentoo Laws. This appears to have been the laſt of his publications. It contains ſome criticiſms which were intended to invalidate the opinion which Mr Halhed had conceived concerning the great antiquity of the Gentoo laws; and ſome arguments againſt a notion which had been adopted by ſeveral writers, drawn from the obſervation of natural phenomena, that the world is far more ancient than it is repreſented to be by the Hebrew chronology. Mr Coſtard died on the 10th of January 1782. He was a man of uncommon learning, and eminently ſkilled in Grecian and oriental literature. His private character was amiable, and he was much reſpected in the neighbourhood in which he lived for his humanity and benevolence. Beſides the works already mentioned, he wrote ſome others; and was alſo the author of learned papers, inſerted in the Philoſophical Tranſactions, on aſtronomical and chronological ſubjects.

COSTIVENESS, a preternatural detention of the feces, with an unuſual dryneſs and hardneſs thereof, and thence a ſuppreſſion of their evacuation. See MEDICINE *Index*.

COSTMARY, the Engliſh name of a ſpecies of tanſy. See TANACETUM, BOTANY *Index*.

COSTS, in *Law*, imply the expences of a ſuit recovered by the plaintiff, together with damages. Coſts were not allowed by the common law, the amercement of the vanquiſhed party being his only puniſhment; but they are given by ſtatute *. Coſts are allowed in chancery for failing to make anſwer to a bill exhibited, or making an inſufficient anſwer; and if a firſt anſwer be certified by a maſter to be inſufficient, the defendant is to pay 40s; 3l. for a ſecond inſufficient anſwer; 4l. for a third, &c. But if the anſwer be reported good, the plaintiff ſhall pay the defendant 40s. coſts.

COSTUME, a rule or precept in painting, by which the artiſt is enjoined to make every perſon and thing ſuſtain its proper character, and not only obſerve the ſtory, but the circumſtances, the ſcene of action, the country or place, and take care that the habits, arms, manners, proportion, and the like, exactly correſpond.

COSTUS, a genus of plants belonging to the monandria claſs, and in the natural method ranking under the eighth order, *Scitamineæ*. See BOTANY *Index*.

COTA, RODRIGUEZ, a Spaniſh poet in the 16th century, was the author of the *Tragi-comedia de Caliſto y Melibea*, which has been tranſlated into Latin by Gaſper Barthius, and into French by James de Lavardin. The Spaniards ſet a great value on this performance.

CO-TANGENT, the tangent of an arch which is the complement of another to 90. See GEOMETRY.

COTBUS, a town of Germany in Lower Luſatia. It is a ſtrong important place, and has been ſubject to the king of Pruſſia ever ſince the year 1645. It is ſeated on the river Spree, 60 miles ſouth-by-eaſt of Berlin, and 55 ſouth-eaſt of Wirtemburg. Here are a great number of French Proteſtants, who have introduced manufactures; and this place is noted for excellent beer, pitch, and the cultivation of flax. E. Long. 15. 29. N. Lat. 51. 40.

COTE, a term uſed in courſing, to expreſs the advantage one greyhound has over another when he runs by the ſide of it, and putting before it, gives the hare a turn. See COURSING.

Cote-Gare, a kind of refuſe wool, ſo clung or clotted together that it cannot be pulled aſunder. By 13 Rich. II. ſtat. 1. c. 9. it is provided, that neither denizen or foreigner make any other refuſe of wool, but cot-gare and villein. So the printed ſtatute has it; but in the parliament roll of that year it is *cod-land*, and *villein*. *Cot*, or *cote*, ſignifies as much as cottage in many places, and was ſo uſed by the Saxons according to Verſtegan.

COTELERIUS, JOHN BAPTIST, fellow of the Sorbonne, and king's Greek profeſſor, was born at Niſmes in Languedoc in 1627. He made a collection of the fathers who lived in the apoſtolic age, which he publiſhed at Paris in two volumes folio in 1672; all reviewed and corrected from ſeveral MSS. with a Latin tranſlation and notes. He alſo publiſhed *Monumenta Eccleſiæ Græcæ*, in 3 vols; being a collection of Greek tracts out of the king's and M. Colbert's libraries, and which had never been publiſhed before; to theſe he added a Latin tranſlation and notes. He intended a farther proſecution of this work; but his intenſe ſtudies broke his conſtitution, and deprived him of life in 1686. Beſides his great ſkill in languages and eccleſiaſtical antiquities, Cotelerius was remarkable for his probity and candour.

COTERELLUS. *Cotarius* and *Coterellus*, according to Spelman and Du Freſne, are ſervile tenants; but in Doomſday and other ancient MSS. there appears a diſtinction, as well in their tenure and quality as in their name; for the cotarius hath a free ſoccage tenure, and paid a ſtated firm or rent in proviſions or money, with ſome occaſional cuſtomary ſervices; whereas the coterellus ſeems to have held in mere villenage, and his perſon, iſſue, and goods, were diſpoſable at the pleaſure of the lord.

COTERIE, a term adopted from the French trading aſſociations or partnerſhips, where each perſon advances his quota of ſtock, and receives his proportion of gain; and which retains its original meaning when applied to little aſſemblies or companies aſſociated for mirth and good humour, where each one furniſhes his

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* Blackſt. Comment.

quota of pleaſantry. Here they coin new words not underſtood elſewhere, but which it becomes faſhionable for others to uſe; and they are thought ridiculous who are ignorant of them. It has been ſometimes uſed to ſignify a club of ladies.

COTES, Roger, an excellent mathematician of the 18th century. He early diſcovered an inclination to the mathematics; and at 17 years of age, was admitted a penſioner of Trinity college, Cambridge. In 1706, he was appointed profeſſor of aſtronomy in the profeſſorſhip founded by Dr Plume archdeacon of Rocheſter, being choſen the firſt in that chair for his great merit and learning. In the year 1713, at the requeſt of Dr Richard Bentley, he publiſhed at Cambridge, in 4to, a ſecond edition of Sir Iſaac Newton's *Principia*, with all the improvements which the author had annexed thereto: to which he prefixed an excellent preface. He prepared ſeveral uſeful books for the public; and wrote A Deſcription of the great Meteor which appeared on the 6th of March 1716, publiſhed in the Philoſophical Tranſactions. He lived but a little while to carry on the diſcourſes for which he was eminently qualified; dying in the prime of his age in 1716, to the great regret of all the lovers of the ſciences.

COTESWOLD, ſeveral ſheep-cotes, and ſheep feeding on hills. It comes from the Saxon *cote*, i. e. *caſa*, "a cottage," and *wold*, "a place where there is no wood."

COTHURNUS, Buskin, a very high ſhoe or patten raiſed on ſoles of cork, wore by the ancient actors in tragedy, to make them appear taller and more like the heroes they repreſented, moſt of whom were ſuppoſed to be giants. It covered the greateſt part of the leg, and was tied beneath the knee. Æſchylus is ſaid to have invented the cothurnus. See Buskin.

COTICE, or Cotise', in *Heraldry*, is the fourth part of the bend; which with us is ſeldom or ever borne but in couples, with a bend between them; whence probably the name; from the French *cote*, "ſide;" they being borne, as it were, aſide of the bend.—A bend thus bordered is ſaid to be *cotiſed*, *cotice*. He bears ſable on a bend cotiſed argent three cinquefoils.

COTILLON, the name of a well-known briſk dance, in which eight perſons are employed. The term is French, and ſignifies an under-petticoat.

COTRONE, a town in the Hither Calabria ſtanding on the ſite of the ancient Croton, though not occupying the ſame extent of ground: (See Croton). It is fortified with ſingle walls, and a caſtle erected by Charles V. Its private buildings are poor and ſordid, the ſtreets diſmal and narrow. Cheeſe and corn are the principal commodities. For the ſtowage of corn, there are ranges of granaries in the ſuburbs; and the annual export is about 20,000 tomoti. The cheeſe is tolerably good; but has a great deal of that hot acrid taſte ſo common to all cheeſe made with goats milk. The wine is not unpleaſant, and appears ſuſceptible of improvement by better management in the making and keeping.

COTT, a particular ſort of bed-frame, ſuſpended from the beam of a ſhip for the officers to ſleep in between the decks. This contrivance is much more convenient at ſea than either the hammocks or fixed cabins: being a large piece of canvas ſewed into the form of a cheſt, about ſix feet long, and one foot deep, and from two to three feet wide. It is extended by a ſquare wooden frame with a canvas bottom, equal to its length and breadth, to retain it in an horizontal poſition.

COTTAGE, Cottagium, is properly a little houſe for habitation without lands belonging to it: ſtat. 4. Edw. I. But by a later ſtatute 31 Eliz. c. 7. no man may build a cottage unleſs he lay four acres of land thereto; except it be in market-towns or cities, or within a mile of the ſea, or for the habitation of labourers in mines, ſailors, foreſters, ſhepherds, &c. and cottages erected by order of juſtices of the peace for poor impotent people are excepted out of the ſtatute. The four acres of land to make it a cottage within the law are to be freehold, and land of inheritance; and four acres holden by copy, or for life or lives, or for any number of years, will not be ſufficient to make a lawful cottage.

COTTON, in *Commerce*, a ſoft downy ſubſtance found on the goſſypium, or cotton-tree. See Gossypium, Botany *Index*.

Cotton is ſeparated from the ſeeds of the plant by a mill, and then ſpun and prepared for all ſorts of fine work, as ſtockings, waiſtcoats, quilts, tapeſtry, curtains, &c. With it they likewiſe make muſlin; and ſometimes it is mixed with wool, ſometimes with ſilk, and even with gold itſelf.

The fineſt ſort comes from Bengal and the coaſt of Coromandel.

Cotton makes a very conſiderable article in commerce, and is diſtinguiſhed into cotton-wool and cotton-thread. The firſt is brought moſtly from Cyprus, St John d'Acre, Smyrna, and the Eaſt and Weſt Indies; the moſt eſteemed is white. Thoſe who buy it in bales ſhould ſee that it has not been wet: moiſture being very prejudicial to it.

Of cotton-thread, that of Damas, called *cotton d'ounce*, and that of Jeruſalem, called *bazas*, are the moſt eſteemed; as alſo that of the Weſt India iſlands. It is to be choſen white, fine, very dry, and evenly ſpun. The other cotton threads are the half bazas, the rames, the beledin, and gondezel; the payas and mountaſiri, the geneguins, the baquins, the joſſelaſſars, of which there are two ſorts. Thoſe of India, known by the name of Tutucorin, Java, Bengal, and Surat, are of four or five ſorts, diſtinguiſhed by the letters A, B, C, &c. They are ſold in bags, with a deduction of one pound and a half on each of thoſe of Tutucorin, which are the deareſt, and two pounds on each bag of the other ſorts. For thoſe of Fielebas, Smyrna, Aleppo, and Jeruſalem, the deduction at Amſterdam is eight in the hundred for the tare, and two in the hundred for weight, and on the value one per cent. for prompt payment.

Cotton of Siam, is a kind of ſilky cotton in the Antilles, ſo called becauſe the grain was brought from Siam. It is of an extraordinary fineneſs, even ſurpaſſing ſilk in ſoftneſs. They make hoſe of it there preferable to ſilk ones for their luſtre and beauty. They ſell from 10 to 12 and 15 crowns a pair, but there are very few made unleſs for curioſity.

The manner of packing Cotton as practiſed in the Antilles. The bags are made of coarſe cloth, of which the they take three ells and a half each; the breadth is one ell three inches. When the bag has been well ſoaked in water, they hang it up, extending the mouth of it to croſs pieces of timber nailed to poſts fixed in the ground ſeven or eight feet high. He who packs it goes into the bag, which is ſix feet nine inches deep, or thereabouts, and preſſes down the cotton, which another hands him, with hands and feet; obſerving to tread it equally everywhere, and putting in but little at a time. The beſt time of packing is in rainy moiſt weather, provided the cotton be under cover. The bag ſhould contain from 300 to 320 pounds. The tare abated in the Antilles is three in the hundred. Cotton being a production applicable to a great variety of manufactures, it cannot be too much cultivated in our own plantations that will admit of it.

Cotton-Spinning, the art or proceſs of reducing cotton-wool into yarn or thread.

The moſt ſimple method for this purpoſe, and the only one in uſe for a long time in this country, was by the hand upon the well-known domeſtic machine called a *one-thread wheel*. But as the demand for cotton-goods began to increaſe, other inventions were thought of for expediting this part of the manufacture. About 50 years ago, one Paul and others of London contrived an engine for a more eaſy and expeditious method of ſpinning cotton, and for which they obtained a patent; but the undertaking did not prove ſucceſsful. Some years thereafter, various machines were conſtructed by different perſons for facilitating the ſpinning of cotton; but without producing any very material or laſting advantage. At length, about the year 1767, Mr James Hargrave, a weaver in the neighbourhood of Blackburn in Lancaſhire, conſtructed a machine by which a great number of threads (from 20 to 80) might be ſpun at once, and for which he obtained his majeſty's letters-patent. This machine is called a *jenny*, and is the beſt contrivance for ſpinning *woof* or *ſhute* that has hitherto appeared. It is now commonly conſtructed for 84 threads; and with it one perſon can ſpin 100 Engliſh hanks in the day, each hank containing 840 yards.

Carding of cotton, as a preparation for ſpinning, uſed formerly to be performed by the hand, with a ſingle pair of cards upon the knee: but this being a tedious method, ill ſuited to the rapid operations of the new ſpinning machines, other methods were contrived for affording a quicker and more adequate ſupply. The firſt improvement for this purpoſe was likewiſe made by Mr Hargrave; and conſiſted in applying two or three cards to the ſame board, and fixing them to a ſtool or ſtock; whence they obtained the name of *ſtock cards*. With theſe, one woman could perform two or three times as much work as ſhe could do before in the common way. A ſtill more expeditious method of carding, however, by what are commonly called *cylinder cards*, was ſoon afterwards invented, and is that which is now moſt commonly practiſed: but as ſeveral perſons lay claim to this invention, it is not eaſy to determine to whom in particular the merit of it is due.

The next and moſt capital improvements which this branch of manufacture received were from Mr Arkwright, a native of Lancaſhire, afterward Sir Richard Arkwright of Cromford in Derbyſhire. He firſt brought forward his new method of ſpinning cotton in 1768, for which he obtained a patent in 1769. In 1775, he obtained another patent for engines which he had conſtructed to prepare the materials for ſpinning; though one of theſe patents, being challenged at law, was ſet aſide ſome years before it expired. The reſult of Mr Arkwright's different inventions and improvements is a combination of machinery, by which cotton is *carded*, *roved*, and *ſpun*, with the utmoſt exactneſs and equality; and ſuch a degree of perfection attained in ſpinning *warp*, as is not to be equalled in any other part of the world. To theſe improvements this country is entirely indebted for the great extent of its cotton manufactures; large buildings having been erected for that branch both in England and Scotland, many of which contain ſeveral thouſands of ſpindles, each driven by one or more large water wheels; and ſome of ſuch extent as to ſpin at the rate of one thouſand yards of twiſt or warp yarn in the minute.

Other machines have been invented at different times, and a variety of improvements made by different mechanics and manufacturers; one of which in particular we muſt not omit to mention. It is called a *mule*, being a kind of mixture of machinery between the *warp*-machine of Mr Arkwright and the *woof*-machine or hand jenny of Mr Hargrave; and was alſo invented in Lancaſhire. This machine bids fair to be of great uſe in ſpinning cotton-yarn for muſlins to a degree of fineneſs never before known in this country, being nearly equal in quality to thoſe uſually brought from India.

Cotton-Mills, are large buildings with peculiar machinery for carding, roving, and ſpinning cotton: (ſee the preceding article.)—Theſe were entirely unknown in this country before the different inventions and improvements of Meſſrs Arkwright and Hargrave; ſince which time great numbers have been erected in England, many in Scotland, and ſome in Ireland.

The firſt erections of the kind were by Meſſrs Arkwright and Hargrave, both in the town of Nottingham, and both nearly at the ſame time. The engines were then driven by horſes; but ſince that time they have been chiefly erected upon water-falls in different parts of the country; particularly the warp-machines, which are better adapted for being driven by water than any other. The moſt extenſive of theſe is in the village and neighbourhood of Cromford in Derbyſhire, and under the immediate inſpection of Sir Richard Arkwright. The firſt that was erected in Scotland was for Mr Peter Brotherſton, under the inſpection and direction of Mr John Hacket from Nottingham; and is in the neighbourhood of Pennycuick near Edinburgh. Since which time ſeveral have been erected in the neighbourhood of Glaſgow, Paiſley, Lanark, Perth, &c. Many are driven by ſteam-engines.

General State of the Cotton Manufactory. The facilities which the manufacturers of Great Britain had ſuddenly acquired, and the immenſe capitals which they have ſo recently laid out in expenſive machinery and other heavy eſtabliſhments for carrying on the cotton trade, are unparalleled in the annals of the world. Above 140 cotton mills are now (1787) built in Great Britain, of which nearly two-thirds have been erected within theſe ſeven years. Beſides theſe, there are above 20,500 hand-mills or jennies for ſpinning the ſhute for the twiſted yarn ſpun by the water-mills.

Above a million of money was within this time ſunk in mills, hand-engines, and other machines, including the grounds and neceſſary buildings.

Expence of water-mills, -	L. 715,000
Ditto of hand jennies, houſes, buildings, and auxiliary machinery, ſuppoſed at leaſt,	285,000
Total,	L. 1,000,000

A power had been alſo created of working nearly two millions of ſpindles; and men, women, and children were trained to this buſineſs, capable of carrying the cotton manufacture almoſt to any extent. In 1787, the power of ſpindles capable of being worked was eſtimated as follows:

In the water-mills, - - -	286,000
In the jennies, - -	1,665,100
Total ſpindles,	1,951,100

In the branches applicable to muſlin and callico, it was calculated that employment was given to 100,000 men and women, and at leaſt 60,000 children; many of the latter having been taken from different pariſhes and hoſpitals in Great Britain.

The quantity of the raw material of cotton wool conſumed in this manufacture, which did not amount to 6,000,000 pounds in 1781, and was only about 11,000,000 pounds ſix years ago, had amounted in the year 1787 to the enormous height of 22,000,000 lb. and upwards; and the aſtoniſhing rapidity of this increaſe is in ſome meaſure to be attributed to the extenſion of theſe branches to the goods of India, particularly the callicoes and muſlins.

Britiſh callicoes were firſt made in Lancaſhire about the year 1772, but the progreſs was ſlow till within theſe laſt 12 years. The quantity manufactured has ſince extended from about 50,000 to 1,000,000 of pieces made in the courſe of a ſingle year.

Britiſh muſlins were not ſucceſsfully introduced until the year 1781, and were carried to no great extent until 1785, after which period the progreſs during two years became rapid beyond all example. The acquiſition of cotton wool of a ſuperior quality from Demerara and the Brazils, and the improvements made in the ſpinning fine yarns upon the mule jennies, had given a ſpring to this branch of the cotton manufactory, which extended it beyond what it was poſſible to have conceived. Above half a million pieces of muſlin of different kinds, including ſhawls and handkerchiefs, were computed to be annually made in Great Britain; while the quantity not only increaſed daily with the new acceſſion of powers that were burſting forth upon the country, but the quality was exceedingly improved; and ſince a yearly ſupply of about 300 bales of Eaſt Indian cotton has been obtained by the way of Oſtend, yarns have been ſpun, and muſlins have been wove, equal to any from India. Nothing, therefore, but a fine raw material appeared wanting to enable the Britiſh manufacturer to carry this branch to the greateſt extent: and, of all others, it is that ſpecies of cotton goods which deſerves moſt to be encouraged, becauſe of the immenſe return it makes for labour more than any other branch of the cotton manufactory. Eaſt India cotton wool has been ſpun into one pound of yarn worth five guineas; and when wove into muſlin, and afterwards ornamented by children in the tambour, has extended to the value of 15l.; yielding a return of 5900 per cent. on the raw material.

But the ſtate of the raw materials, and the progreſſive and aſtoniſhing increaſe of this manufacture, will be beſt explained by what follows:

	Cotton Wool uſed in the Manufacture.	Suppoſed Value when Manufactured.
1781,	lb. 5,101,920	L. 2,000,000
1782,	11,206,810	3,900,000
1783,	9,546,179	3,200,000
1784,	11,280,238	3,950,000
1785,	17,992,888	6,000,000
1786,	19,151,867	6,500,000
1787,	22,600,000	7,500,000

Such was the progreſs of the Britiſh cotton manufactory till 1787; when, with eſtabliſhments and mechanical powers capable of bringing forward immenſe quantities of goods into the conſumption, this manufacture was checked by a great and ſudden reduction of the prices of Eaſt India goods of the ſame ſpecies, which were ſold above 20 per cent. on an average under the loweſt prices at which the Britiſh manufacturer can afford to ſell without loſs.

This conduct in the Eaſt India Company quickly operated to the great prejudice of the Britiſh manufactures; and there is no ſaying how far theſe might be reduced, ſhould that company be allowed to preſs goods upon the market at prices which have no relation to the original coſt, and under circumſtances where every idea of protecting duties is annihilated in the effect of the general ſyſtem.

The home-manufacture of this article, however, in all its different branches, has been greatly extended, and is likely to be carried on with greater advantage to the manufacturer than ever it was before.

Lavender Cotton. See Santolina, Botany *Index*.

Philoſophic Cotton, a name given to the flowers of zinc, on account of their white colour, extreme lightneſs, and reſemblance to cotton.

Flax made to reſemble Cotton. See Flax.

*Silk-*Cotton. See Bombax, Botany *Index*.

Cotton*-Weed*. See Gnaphalium, Botany *Index*.

Cotton, *Sir Robert*, a moſt eminent Engliſh antiquarian, deſcended from an ancient family, was born in 1570. In his 18th year he began to collect ancient records, charters, and other MSS. Camden, Selden, and Speed, acknowledged their obligations to him in their reſpective works. He was highly diſtinguiſhed by Queen Elizabeth, and by James I. who created him a baronet. He wrote many things himſelf; but our principal obligations to him are for his valuable library, conſiſting of curious manuſcripts, &c. which he was 40 years in collecting. At his death in 1631, he left the property of it to his family, though deſigned for public uſe. A large acceſſion was made to this library by private benefactions before the death of the founder, and afterwards by the purchaſes of his heirs, and donations of others, who added to it a great number of books, chiefly relating to the hiſtory and antiquities of our own nation. An act of parliament was obtained, at the requeſt of Sir John Cotton, in 1790, for preſerving it after his deceaſe, under the above denomination, for public uſe. It is now fixed in the Britiſh Muſeum. For ſtatutes relating to it, ſee 12 and 13 W. III. c. 3. and 5. Anne cap. 30.

Cotton, *Charles*, a burleſque poet, was deſcended of a good family, and lived in the reign of Charles II. and James II. His moſt celebrated piece is *Scarronides*, or *Traveſtie* of the firſt and fourth books of the Æneid. But though, from the title, one would be apt to imagine it an imitation of Scarron's famous Traveſtie of the ſame author, yet upon examination, it would be found greatly to excel not only that, but every other attempt of the ſame kind that hath been hitherto made in any language. He has alſo tranſlated ſeveral of Lucian's dialogues, in the ſame manner, under the title of *The Scoffer Scoff'd*;—and written another poem of a more ſerious kind, entitled *The Wonders of the Peak*. The exact period of either Mr Cotton's birth or his death, is nowhere recorded; but it is probable the latter happened about the time of the revolution. Neither is it better known what his circumſtances were with reſpect to fortune: they appear, however, to have been eaſy, if one may judge from the turn of his writings, which is ſuch as ſeems ſcarcely poſſible for any one to indulge whoſe mind was not perfectly at eaſe. Yet there is one anecdote told of him, which ſeems to ſhow that his vein of humour could not reſtrain itſelf on any conſideration, viz. that in conſequence of a ſingle couplet in his *Virgil Traveſtie*, wherein he has made mention of a peculiar kind of ruff worn by a grandmother of his who lived in the Peak, he loſt an eſtate of 400l. per annum; the old lady, whoſe humour and teſty diſpoſition he could by no means have been a ſtranger to, being never able to forgive the liberty he had taken with her; and having her fortune wholly at her diſpoſal, although ſhe had before made him her ſole heir, altered her will, and gave it away to an abſolute ſtranger.

COTTUS, or *Bull-head*, a genus of fiſhes belonging to the order of thoracici. See Ichthyology *Index*.

COTULA, may-weed, a genus of plants belonging to the ſyngeneſia claſs. See Botany *Index*.

Cotula, or *Cotyla*, a liquid meaſure in uſe among the ancients.

Fannius ſays, the cotyla was the ſame thing with the hemina, which was half a ſextary.

> *At* cotylas, *quas ſi placeat, dixiſſe licebit*
> *Heminas recepit geminas ſextarias unus.*

Chorier obſerves, that the cotyla was uſed as a dry meaſure as well as a liquid one; from the authority of Thucydides, who in one place mentions two cotylæ of wine, and in another two cotylæ of bread.

COTURNIX. See Tetrao, Ornithology *Index*.

COTYLEDON, navel-wort, a genus of plants belonging to the decandria claſs; and ranking under the natural order, *Succulentæ*. See Botany *Index*.

COTYLEDONES, in *Anatomy*, are certain glandular bodies, adhering to the chorion of ſome animals.

Cotyledones, in *Botany*, the periſhable porous ſide lobes of the ſeed, which involve, and for ſome time furniſh nouriſhment to, the embryo plant. See Botany *Index*.

COTYTTO, the goddeſs of all debauchery. Her feſtivals, called *Cotyttia*, were celebrated by the Athenians, Corinthians, Thracians, &c. during the night. Her prieſts were called *baptæ*, and nothing but debauchery and wantonneſs prevailed at the celebration. A feſtival of the ſame name was obſerved in Sicily, where the votaries of the goddeſs carried about boughs hung with cakes and fruit, which it was lawful for any perſon to pluck off. It was a capital puniſhment to reveal whatever was ſeen or done at theſe ſacred feſtivals. It coſt Eupolis his life for an unſeaſonable reflection upon them. The goddeſs Cotytto is ſuppoſed to be the ſame as Proſerpine.

COUCH, in *Painting*, denotes a lay, or impreſſion of colour, whether in oil or water, wherewith the painter covers his canvas, wall, wainſcot, or other matter to be painted.

The word is alſo uſed for a lay or impreſſion on any thing, to make it firm and conſiſtent, or to ſcreen it from the weather.

Paintings are covered with a couch of varniſh; a canvas to be painted muſt firſt have two couches of ſize, before the colours be laid; two or three couches of white lead are laid on wood, before the couch of gold be applied: the leather-gilders lay a couch of water and whites of eggs on the leather, before they apply the gold or ſilver-leaf.

The gold-wire-drawers alſo uſe the word *couch* for the gold or ſilver leaf wherewith they cover the maſs to be gilded or ſilvered, before they draw it through the iron that is to give it its proper thickneſs.

The gilders uſe couch for the quantity of gold or ſilver leaves applied on the metals in gilding or ſilvering. Each couch of gold is about one leaf, or two at moſt, and each of ſilver three to gild: if the gilding be hatched, there are required from eight to twelve couches; and only three or four if it be without hatching. To ſilver there are required from four to ten couches, according to the beauty of the work.

Couch-Graſs. See Triticum, Botany *Index*.

COUCHANT, in *Heraldry*, is underſtood of a lion, or other beaſt, when lying down, but with his head raiſed; which diſtinguiſhes the poſture of couchant from dormant, wherein he is ſuppoſed quite ſtretched out and aſleep.

COUCHE, in *Heraldry*, denotes any thing lying along: thus chevron-couche, is a chevron lying ſidewiſe, with the two ends on each ſide of the ſhield, which ſhould properly reſt on the baſe.

COUCHER, or Courcher, in our ſtatutes, is uſed for a factor, or one that continues in ſome place or country for traffic; as formerly in Gaſcoign, for the buying of wines. Anno 37 Edw. III. c. 16.

Coucher, is alſo uſed for the general book in which any religious houſe or corporation regiſter their particular acts. Anno 3 and 4 Edw. VI. c. 10.

COUCHING *of a* Cataract, in *Surgery*. See Surgery *Index*.

COVE, a ſmall creek or bay, where boats and ſmall veſſels may ride at anchor, ſheltered from the wind and ſea.

COVENANT, in *Law*, is the conſent and agreement of two or more perſons to do, or not to do, ſome act, or thing, contracted between them. Alſo it is the declaration the parties make, that they will ſtand to ſuch agreement, relating to lands or other things; and is created by deed in writing, ſealed and executed by the parties, or otherwiſe it may be implied in the contract as incident thereto. And if the perſons do not perform their covenants, a writ or action of covenant is the remedy to recover damages for the breach of them.

COVENANT, in eccleſiaſtical hiſtory, denotes a contract or convention agreed to by the Scotch in the year 1638, for maintaining their religion free from innovation. In 1581, the general aſſembly of Scotland drew up a confeſſion of faith, or national covenant, condemning epiſcopal government, under the name of *hierarchy*, which was ſigned by James I. and which he enjoined on all his ſubjects. It was again ſubſcribed in 1590 and 1596. The ſubſcription was renewed in 1638, and the ſubſcribers engaged by oath to maintain religion in the ſame ſtate as it was in 1580, and to reject all innovations introduced ſince that time. This oath annexed to the confeſſion of faith received the name of the *covenant*: as thoſe who ſubſcribed it were called *covenanters*.

COVENANT, in *Theology*, is much uſed in connection with other terms; as, 1. *The Covenant of Grace* is that which is made between God and thoſe who believe the goſpel, whereby they declare their ſubjection to him, and he declares his acceptance of them and favour to them. The goſpel is ſometimes denominated a *covenant of grace*, in oppoſition to the Moſaic law. 2. *Covenant of Redemption* denotes a mutual ſtipulation, tacit or expreſs, between Chriſt and the Father, relating to the redemption of ſinners by him, previous to any act on Chriſt's part under the character of Mediator. 3. *Covenant of Works* ſignifies, in the language of ſome divines, any covenant whereby God requires perfect obedience from his creatures, in ſuch a manner as to make no expreſs proviſion for the pardon of offences to be committed againſt the precepts of it, on the repentance of ſuch ſuppoſed offenders, but pronounces a ſentence of death upon them: ſuch, they ſay, was the covenant made with Adam in a ſtate of innocence, and that made with Iſrael at Mount Sinai.

Solemn League and COVENANT, was eſtabliſhed in the year 1643, and formed a bond of union between Scotland and England. It was ſworn and ſubſcribed by many in both nations; who hereby ſolemnly abjured popery and prelacy, and combined together for their mutual defence. It was approved by the parliament and aſſembly at Weſtminſter, and ratified by the general aſſembly of Scotland in 1645. King Charles I. diſapproved of it when he ſurrendered himſelf to the Scots army in 1646: but in 1650 Charles II. declared his approbation both of this and the national covenant by a ſolemn oath; and in Auguſt of the ſame year, made a farther declaration at Dunfermline to the ſame purpoſe, which was alſo renewed on occaſion of his coronation at Scone in 1651. The covenant was ratified by parliament in this year; and the ſubſcription of it required by every member, without which the conſtitution of the parliament was declared null and void. It produced a ſeries of diſtractions in the ſubſequent hiſtory of that country, and was voted illegal by parliament, and proviſion made againſt it. Stat. 14 Car. II. c. 4.

Ark of the COVENANT, in Jewiſh antiquity. See ARK.

COVENTRY, a town of Warwickſhire, in England, ſituated in W. Long. 1. 26. N. Lat. 52. 25. It is an ancient place, and is ſuppoſed to derive its name from a convent formerly ſituated here. Leofric, earl of Mercia, who rebuilt the religious houſe after it had been deſtroyed by the Danes, and was lord of the place about the year 1040, is ſaid, upon ſome provocation, to have loaded them with heavy taxes. Being importuned by his lady, Godina, to remit them, he conſented, upon condition that ſhe ſhould ride naked through the town, which he little imagined ſhe would ever comply with. But he found himſelf miſtaken: for ſhe accepted the offer, and rode through the town with her long hair ſcattered all over her body; having firſt enjoined the citizens not to venture, on pain of death, to look out as ſhe paſſed. It is ſaid, however, that a certain taylor could not help peeping: and to this day there is an effigy of him at the window whence he looked. To commemorate this extraordinary tranſaction, and out of reſpect to the memory of their patroneſs, the citizens make a proceſſion every year, with the figure of a naked woman on horſeback. After Leofric's death, the earls of Cheſter became lords of the city, and granted it many privileges. At length it was annexed to the earldom of Cornwall; and growing conſiderable, had divers immunities and privileges conferred upon it by ſeveral kings; particularly that of a mayor and two bailiffs by Edward III.; and Henry VI. made it, in conjunction with ſome other towns and villages, a diſtinct county, independent of the county of Warwick. But afterwards Edward VI. for their diſloyalty, deprived them of their liberties, which were not reſtored till they had paid a fine of 500 merks. By a charter from James I. an alderman is allotted to each ward, with the powers of the juſtices of the peace within the city and its liberties. The walls were ordered to be demoliſhed at the Reſtoration; and now nothing remains of them but the gates, which are very lofty. Coventry is noted for the two parliaments which were held in it; the one called the parliament of *Dunces*, and the other of *Devils*. The former was ſo called on account of the excluſion of the lawyers; and the attainders of the duke of York, the earls of Saliſbury, Warwick, and March, procured the other the epithet of *Devils*. The town-houſe of Coventry is much admired for its painted windows, repreſenting ſeveral kings and others that have been benefactors to the city. The chief manufactures carried on here are temmies and ribbands.

Coventry ſends two members to parliament, and gives title of earl to an ancient family of the ſame name.—Coventry is a biſhop's ſee. The biſhoprick is ſaid to have been founded by Oſwy king of Mercia, in the year 656 or 657; and although it hath a double name, yet, like Bath and Wells, it is a ſingle dioceſe. It was ſo extremely wealthy, that King Offa, by the favour of Pope Adrian, conſtituted it an archiepiſcopal ſee; but this title was laid aſide on the death of that king. In 1075, Peter, the 34th biſhop, removed the ſee to Cheſter. In 1102, Robert de Limſey, his immediate ſucceſſor, removed it to Coventry; and Hugo Novant, the 41ſt biſhop, removed it back to Litchfield, but with great oppoſition from the monks of Coventry. The diſpute was finally ſettled in a manner nearly ſimilar to that which is mentioned between Bath and Wells. Here it was agreed that the biſhop ſhould be ſtyled from both places, and that Coventry ſhould have the precedence; that they ſhould chooſe the biſhop alternately; and that they ſhould both make one chapter to the biſhop, in which the prior of Coventry ſhould be the chief man. Matters continued thus till the Reformation, when the priory of Coventry being diſſolved by King Henry VIII. the ſtyle of the biſhop continued as before. But an act of parliament paſſed 33d of King Henry VIII. to make the dean and chapter of Litchfield one ſole chapter to the biſhop. This ſee hath given three ſaints to the church; and to the nation one lord chancellor, three lord treaſurers, three preſidents of Wales, one chancellor to the univerſity of Cambridge, and one maſter of the wardrobe. The old church built by King Oſwy being taken down by Roger de Clinton, the 37th biſhop, he built the beautiful fabric that now ſtands in 1148, and dedicated it to the Virgin Mary and St Chad. During the grand rebellion, the church ſuffered much; but ſoon after the Reſtoration, it was repaired and beautified. This dioceſe contains the whole counties of Stafford and Derby (except two pariſhes of the former), the largeſt part of Warwickſhire, and nearly one half of Shropſhire, in which are 555 pariſhes, of which 250 are impropriate. It hath four archdeaconries, viz. Stafford, Derby, Coventry, and Shrewſbury. It is valued in the king's books at 559l. 18. 2¾d. and is computed to be worth annually 2800l. The clergy's tenth is 590l. 16s. 11¼d. To this cathedral belong a biſhop, a dean, a precentor, a chancellor, a treaſurer, four archdeacons, twenty-ſeven prebendaries, five prieſt-vicars, ſeven lay clerks or ſinging men, eight choriſters, and other under officers and ſervants.

CO-VERSED Sine, in *Geometry*, the remaining part of the diameter of a circle, after the verſed ſine is taken from it. See Geometry.

COVERT in *Law*.—*Femme Covert* denotes a woman married, and ſo covered by, or under the protection of, her huſband.

Covert Way, or Corridor, in *Fortification*, a ſpace of ground, level with the field on the edge of the ditch, three or four fathoms broad, ranging quite round the half moons and other works towards the country. It has a parapet raiſed on a level, together with its banquets and glacis. See Fortification.

COVERTURE, in *Law*, is applied to the ſtate and condition of a married woman, who is under the power of her huſband, and therefore called *femme couvert*.

COUGH, in *Medicine*. See Medicine *Index*.

Cough, in *Farriery*. See Farriery *Index*.

Cough, called the huſk, is a diſeaſe to which young bullocks are ſubject. In this diſorder the wind-pipe and its branches are loaded with ſmall taper worms. Farmers count the diſeaſe incurable; but fumigations with mercurials, as cinnabar, or with fœtids, as tobacco, might prove ſerviceable.

COUHAGE, or stinking beans; a kind of kidney-beans imported from the Eaſt Indies, where they are uſed as a cure for the dropſy. The down growing on the outſide of the pod is ſo pointed as, like a nettle, to ſting the fleſh, though not with ſo painful a ſenſation. This, by a corruption of the word, is called *cowitch*. See Dolichos, Botany *Index*.

COVIN, a deceitful compact or agreement between two or more to deceive or prejudice a third perſon: As, if a tenant for life conſpire with another, that this other ſhall recover the land which the tenant holds in prejudice of him in reverſion. Dr Skinner takes the word to be a corruption of the Latin *conventum*, and therefore writes it *coven*. See Conspiracy.

COVING, in building, is when houſes are built projecting over the ground-plot, and the turned projecture arched with timber, lathed and plaſtered.

COVINUS, among the ancients, a kind of chariot, in which the Gauls and Britons uſed to fight in battles.

COUL, or Cowl. See Cowl.

COULTER, in *Huſbandry*, an iron inſtrument, fixed in the beam of a plough, and ſerving to cut the edge of each furrow. See Agriculture.

COUNCIL, or Counsel, in a general ſenſe, an aſſembly of divers conſiderable perſons to concert meaſures relative to the ſtate.

In Britain, the law, in order to aſſiſt the king in the diſcharge of his duties, the maintenance of his dignity, and the exertion of his prerogative, hath aſſigned him a diverſity of councils to adviſe with.

1. The firſt of theſe is the high court of parliament. See Parliament.

2. The peers of the realm are by their birth hereditary counſellors of the crown; and may be called together by the king, to impart their advice in all matters of importance to the realm, either in time of parliament, or, which hath been their principal uſe, when there is no parliament in being. Accordingly, Bracton, ſpeaking of the nobility of his time, ſays, they might properly be called "conſules à conſulendo; reges enim tales ſibi aſſociant ad conſulendum." And in the law-books it is laid down, that the peers are created for two reaſons: 1. *Ad conſulendum*, 2. *Ad defendendum, regem*: for which reaſons the laws gives them certain great and high privileges; ſuch as freedom from arreſts, &c. even when no parliament is ſitting; becauſe the law intends, that they are always aſſiſting the king with their counſel for the common-wealth, or keeping the realm in ſafety by their prroweſs and valour.

Inſtances of conventions of the peers, to adviſe the king, have been in former times very frequent; though now fallen into diſuſe, by reaſon of the more regular meetings of parliament. Sir Edward Coke gives us an extract of a record, 5 Henry IV. concerning an exchange of lands between the king and the earl of Northumberland, wherein the value of each was agreed to be ſettled by advice of parliament (if any ſhould be called before the feaſt of St Lucia), or otherwiſe by advice of the grand council of peers, which the king promiſes to aſſemble before the ſaid feaſt, in caſe no parliament ſhall be called. Many other inſtances of this

Blackſtone's Comment.

this kind of meeting are to be found under our ancient kings: though the formal method of convoking them had been ſo long left off, that when King Charles I. in 1640, iſſued out writs under the great ſeal to call a council of all the peers of England, to meet and attend his majeſty at York, previous to the meeting of the long parliament, the earl of Clarendon mentions it as a new invention, not before heard of: that is, as he explains himſelf, ſo old, that it had not been practiſed in ſome hundreds of years. But though there had not for long time before been an inſtance, nor has there been any ſince, of aſſembling them in ſo ſolemn a manner, yet in caſes of emergency, our princes have at ſeveral times thought proper to call for, and conſult as many of the nobility as could eaſily be brought together; as was particularly the caſe with King James II. after the landing of the prince of Orange; and with the prince of Orange himſelf before he called the convention parliament which afterwards called him to the throne.

Beſides this general meeting, it is uſually looked upon to be the right of each particular peer of the realm, to demand an audience of the king, and to lay before him with decency and reſpect ſuch matters as he ſhall judge of importance to the public weal. And therefore, in the reign of Edward II. it was made an article of impeachment in parliament againſt the two Hugh Spencers, father and ſon, for which they were baniſhed the kingdom, "that they by their evil covin would not ſuffer the great men of the realm, the king's good counſellors, to ſpeak with the king, or to come near him; but only in preſence and hearing of ſaid Hugh the father and Hugh the ſon, or one of them, and at their will, and according to ſuch things as pleaſed them."

3. A third council belonging to the king, are, according to Sir Edward Coke, his judges of the courts of law, for law-matters. And this appears frequently in the Engliſh ſtatutes, particularly 14 Edward III. c. 5. and in other books of law. So that when the king's council is mentioned generally, it muſt be defined, particularized, and underſtood, *ſecundum ſubjectam materiem;* "according to the ſubject matter;" and if the ſubject be of a legal nature, then by the king's council is underſtood his council for matters of law; namely, his judges. Therefore, when by ſtatute 16 Richard II. c. 5. it was made a high offence to import into England any papal bulls, or other proceſſes from Rome; and it was enacted, that the offenders ſhould be attached by their bodies and brought before the king and his council to anſwer for ſuch offence; here, by the expreſſion of king's *council*, were underſtood the king's judges of his courts of juſtice, the ſubject matter being legal: this being the general way of interpreting the word *council*.

4. But the principal council belonging to the king is his *privy council*, which is generally by way of eminence, called *the council*. For an account of its conſtitution and powers, ſee the article Privy-*Council*.

Aulic Council. See Aulic.

Common Council, in the city of London, is a court wherein are made all the bye-laws which bind the citizens. It conſiſts, like the parliament, of two houſes; an upper, compoſed of the lord-mayor and aldermen; and a lower, of a number of common-council men, choſen by the ſeveral wards, as repreſentatives of the body of the citizens.

Council *of War*, an aſſembly of the principal officers of an army or fleet, occaſionally called by the general or admiral to concert meaſures for their conduct with regard to ſieges, retreats, engagements, &c.

Council, in church hiſtory, an aſſembly of prelates and doctors, met for the regulating matters relating to the doctrine or diſcipline of the church.

National Council, is an aſſembly of the prelates of nation under their primate or patriarch.

Oecumenical or *General* Council, is an aſſembly which repreſents the whole body of the univerſal church. The Romaniſts reckon eighteen of them; Bullinger, in his treatiſe de conciliis, ſix; Dr Prideaux, ſeven; and Biſhop Beveridge has increaſed the number to eight, which, he ſays, are all the general councils which have ever been held ſince the time of the firſt Chriſtian emperor. They are as follows: 1. The council of Nice, held in the reign of Conſtantine the Great, on account of the hereſy of Arius. 2. The council of Conſtantinople, called under the reign and by the command of Theodoſius the Great, for much the ſame end that the former council was ſummoned. 3. The council of Epheſus, convened by Theodoſius the younger at the ſuit of Neſtorius. 4. The council of Chalcedon, held in the reign of Martinus, which approved of the Eutychian hereſy. 5. The ſecond council of Conſtantinople, aſſembled by the emperor Juſtinian, condemned the three chapters taken out of the book of Theodorus of Mopſueſtia, having firſt decided that it was lawful to anathematiſe the dead. Some authors tell us, that they likewiſe condemned the ſeveral errors of Origen about the Trinity, the plurality of worlds, and pre-exiſtence of ſouls. 6. The third council of Conſtantinople, held by the command of Conſtantius Pogonatus the emperor, in which they received the definitions of the five firſt general councils, and particularly that againſt Origen and Theodorus of Mopſueſtia. 7. The ſecond Nicene council. 8. The fourth council of Conſtantinople, aſſembled when Louis II. was emperor of the Weſt. The regulations which they made are contained in twenty-ſeven canons, the heads of which are ſet down by M. du Pin, to whom the reader is referred.

COUNSEL, in a general ſenſe, ſignifies advice or inſtruction how to behave in any difficult matter.

Counsel, or *Advocates*, in Engliſh courts of law, are of two ſpecies or degrees; Barristers, and Serjeants. See theſe articles; alſo Advocate.

From both theſe degrees ſome are uſually ſelected to be his majeſty's counſel, learned in the law; the two principal of whom are called his *attorney-general*, and *ſolicitor-general*. The firſt king's counſel, under the degree of ſerjeant, was Sir Francis Bacon, who was made ſo *honoris cauſa*, without either patent or fee; ſo that the firſt of the modern order (who are now the ſworn ſervants of the crown, with a ſtanding ſalary) ſeems to have been Sir Francis North; afterwards lord keeper of the great ſeal to King Charles II. Theſe king's counſel anſwer, in ſome degree, to the advocates of the revenue, *advocati fiſci*, among the Romans. For they muſt not be employed in any caſe againſt the crown without ſpecial licenſe; in which reſtriction they agree with the advocates of the fiſc; but, in the imperial law, the prohibition was carried ſtill farther, and perhaps was more for the dignity of the ſovereign; for, excepting ſome peculiar cauſes, the fiſcal advocates were not permitted to be at all concerned in private ſuits between ſubject and ſubject. A cuſtom has of late years prevailed of granting letters patent of precedence to ſuch barriſters as the crown thinks proper to honour with that mark of diſtinction; whereby they are entitled to ſuch rank and preaudience as are aſſigned in their reſpective patents; ſometimes next after the king's attorney-general, but uſually next after his majeſty's counſel next being. Theſe, as well as the queen's attorney and ſolicitor-general, rank promiſcuouſly with the king's counſel; and, together with them, ſit within the bar of their reſpective courts: but receive no ſalaries, and are not ſworn; and therefore are at liberty to be retained in cauſes againſt the crown. And all other ſerjeants and barriſters indiſcriminately, (except in the court of common-pleas, where only ſerjeants are admitted), may take upon them the protection and defence of any ſuitors, whether plaintiff or defendant; who are therefore called their *clients;* like the dependants on the ancient Roman orators. Theſe indeed practiſed *gratis*, for honour merely, or at moſt for the ſake of gaining influence; and ſo likewiſe it is eſtabliſhed with us, that a counſel can maintain no action for his fees; which are given, not as *locatio vel conductio*, but as *quiddam honorarium;* not as a ſalary or hire, but as a mere gratuity, which a counſellor cannot demand without doing wrong to his reputation; as is alſo laid down with regard to advocates in the civil law, whoſe *honorarium* was directed, by a decree of the ſenate, not to exceed in any caſe 10,000 ſeſterces, or about 80l. of Engliſh money. And in order to encourage due freedom of ſpeech in the lawful defence of their clients, and at the ſame time to check the unſeemly licentiouſneſs of proſtitute and illiberal men (a few of whom may ſometimes inſinuate themſelves even into the moſt honourable profeſſions), it hath been holden that a counſel is not anſwerable for any matter by him ſpoken, relative to the cauſe in hand, and ſuggeſted in the client's inſtructions; although it ſhould reflect upon the reputation of another, and even prove abſolutely groundleſs; but if he mentions an untruth of his own invention, or even upon inſtructions, if it be impertinent to the cauſe in hand, he is then liable to an action from the party injured. And counſel guilty of deceit and colluſion are puniſhable by the ſtatute Weſtm. I. 3 Edw. I. c. 28. with impriſonment for a year and a day, and perpetual ſilence in the courts: a puniſhment ſtill ſometimes inflicted for groſs miſdemeanors in practice.

Blackſtone's Comment.

COUNSELLOR, in general, a perſon who adviſes another: thus we ſay, a counſellor at law, a privy counſellor, &c.

Counsellor *at Law*, a perſon retained by a client to plead his cauſe in a public court of judicature. See Advocate, Barrister, Counsel, and Serjeant.

Privy-Counsellor. See Privy-*Council.*

COUNT, (Comes), a nobleman who poſſeſſes a domain erected into a county. See Viscount.

Engliſh and Scottiſh counts we diſtinguiſh by the title of *earls;* foreign ones ſtill retain their proper name. The dignity of a count is a medium between that of a duke and a baron. According to the modern uſe, moſt plenipotentiaries and ambaſſadors aſſume the title of counts, though they have no county; as the count d'Avaux, &c.

Anciently, all generals, counſellors, judges, and ſecretaries of cities under Charlemagne, were called *counts;* the diſtinguiſhing character of a duke and count being this, that the latter had but one town under him, but the former had ſeveral.

A count has a right to bear on his arms a coronet, adorned with three precious ſtones, and ſurmounted with three large pearls, whereof thoſe in the middle and extremities of the coronet advance above the reſt.

Counts were originally lords of the court, or of the emperor's retinue, and had their name *comites, à comitando*, or *à commeando:* hence thoſe who were always in the palace, or at the emperor's ſide, were called *counts palatine*, or *comites à latere.* See Palatine.

In the times of the commonweath, *comites* among the Romans was a general name for all thoſe who accompanied the proconſuls and proprætors into the provinces, there to ſerve the commonwealth; as the tribunes, præfects, ſcribes, &c.

Under the emperors, *comites* were the officers of the palace. The origin of what we now call *counts* ſeems owing to Auguſtus, who took ſeveral ſenators to be his *comites*, as Dion obſerves, i. e. to accompany him in his voyages and travels, and to aſſiſt him in the hearing of cauſes; which were thus judged with the ſame authority as in full ſenate. Gallienus ſeems to have aboliſhed this council, by forbidding the ſenators being found in the armies; and none of his ſucceſſors re-eſtabliſhed it.

Theſe counſellors of the emperor were really counts, *comites*, i. e. companions of the prince; and they ſometimes took the title thereof, but always with the addition of the emperor's name whom they accompanied: ſo that it was rather a mark of their office than a title of dignity. Conſtantine was the firſt who converted it into a dignity; and under him it was that the name was firſt given abſolutely. The name once eſtabliſhed, was in a little time indifferently conferred, not only on thoſe who followed the court, and accompanied the emperor, but alſo on moſt kinds of officers; a long liſt whereof is given us by Du Cange.

Euſebius tells us, that Conſtantine divided the counts into three claſſes; the firſt bore the title of *illuſtres;* the ſecond that of *clariſſimi*, and afterwards *ſpectabiles;* the third were called *perfectiſſimi.* Of the two firſt claſſes was the ſenate compoſed: thoſe of the third had no place in the ſenate, but enjoyed ſeveral other of the privileges of ſenators.

There were counts who ſerved on land, others at ſea; ſome in a civil, ſome in a religious, and ſome in a legal capacity; as *comes ærarii, comes ſacrarum largitionum, comes ſacri conſiſtorii, comes curiæ, comes capellæ, comes archiatrorum, comes commerciorum, comes veſtiarius, comes horreorum, comes opſoniorum* or *annonæ, comes domeſticorum, comes equorum regiorum* or *comes ſtabuli, comes domorum, comes excubitorum, comes notariorum, comes legum* or *profeſſor in jure, comes limitum* or *marcarum, comes portus Romæ, comes patrimonii*, &c.

Count.

The Franks, Germans, &c. paſſing into Gaul and Germany, did not aboliſh the form of the Roman government: and as the governors of cities and provinces were called *counts*, *comites*, and *dukes*, *duces*, they continued to be called ſo. They commanded in time of war; and in time of peace they adminiſtered juſtice. Thus, in the time of Charlemagne, counts were the ordinary judges and governors of the cities.

Theſe counts of cities were beneath the dukes and counts who preſided over provinces; the firſt being conſtituted in the particular cities under the juriſdiction of the latter. The counts of provinces were in nothing inferior to dukes, who themſelves were only governors of provinces. Under the laſt of the ſecond race of French kings, they got their dignity rendered hereditary, and even uſurped the ſovereignty when Hugh Capet came to the crown; his authority was not ſufficient to oppoſe their encroachments; and hence it is they date the privilege of wearing coronets in their arms; they aſſumed it then, as enjoying the rights of ſovereigns in their particular diſtricts or counties. But, by degrees, moſt of the counties became reunited to the crown.

The quality of count is now become very different from what it was anciently; being now no more than a title, which a king grants upon erecting a territory into a county, with a reſerve of juriſdiction and ſovereignty to himſelf. At firſt there was no clauſe in the patent of erection, intimating the reverſion of the county to the crown in default of heirs male; but Charles IX. to prevent their being too numerous, ordained that duchies and counties, in default of heirs male, ſhould return to the crown.

The point of precedence between counts and marquiſes was formerly much controverted: the reaſon was, that there were counts who were peers of France, but no marquiſes: but the point was given up, and marquiſes took place; though anciently, when counts were governors of provinces, they were on a level even with dukes.

William the Conqueror, as is obſerved by Camden, gave the dignity of counts in fee to his nobles; annexing it to this or that county or province, and allotting for their maintenance a certain proportion of money, ariſing from the prince's profits in the pleadings and forfeitures of the provinces. To this purpoſe he quotes an ancient record, thus: Hen. II. *Rex Angliæ his verbis comitem creavit; ſcintis nos feciſſe Hugonem Bigot comitem de Norf, &c. de tertio denarii de Norwich et Norfolk, ſicut aliquis comes Angliæ, &c.*

The Germans call a count, *graaf*, or *graff*; which, according to a modern critic, properly ſignifies *judge*; and is derived from *gravio* or *graffio*, of γραφω, *I write*. They have ſeveral kinds of theſe counts or graffs; as landgraves, marchgraves, burg-graves, and palſgraves, or counts palatine. Theſe laſt are of two kinds; the former are of the number of princes, and have the inveſtiture of a palatinate; the others have only the title of *count palatine* without the inveſtiture of any palatinate. Some aſſert, that by publicly profeſſing the imperial laws for twenty years, the perſon acquires the dignity of a count palatine; and there are inſtances of profeſſors in law who have aſſumed the title accordingly; but there are others who queſtion this right.

COUNT, in *Law*, denotes the original declaration in a real action; as the declaration is in a perſonal one: the libellus of the civilians anſwers to both. Yet, count and declaration are ſometimes confounded, and uſed for each other; as, count in debt, count in appeal, &c.

Count-wheel
||
Counter-paſſant.

COUNT-*Wheel*, in the ſtriking part of a clock, a wheel which moves round once in 12 or 24 hours. It is ſometimes called the *locking-wheel*. See CLOCK-*Making*.

COUNTER, a term which enters into the compoſition of divers words of our language, and generally implies oppoſition; but when applied to deeds, means an exact copy kept of the contrary party, and ſometimes ſigned by both parties.

COUNTER-*Changed*, in *Heraldry*, the intermixture or oppoſition of any metal with a colour.

COUNTER-*Flory*, in *Heraldry*, is ſaid of a treſſure whoſe flowers-de-luce are oppoſite to others. See HERALDRY.

COUNTER-*Drawing*, in *Painting*, is the copying a deſign, or painting, by means of a fine linen-cloth, an oiled paper, or other tranſparent matter, where the ſtrokes appearing through are followed with a pencil, with or without colour. Sometimes it is done on glaſs, and with frames or nets divided into ſquares with ſilk or with thread, and alſo by means of inſtruments invented for the purpoſe, as the parallelogram.

COUNTER-*Ermine*, in *Heraldry*, is the contrary of ermine, being a black field with white ſpots.

COUNTERFEITS, in *Law*, are perſons that obtain any money or goods by counterfeit letters or falſe tokens, who being convicted before juſtices of aſſize or of peace, &c. are to ſuffer ſuch puniſhment as ſhall be thought fit to be inflicted under death, as impriſonment, pillory, &c.

COUNTER-FOIL, or COUNTER-*ſtock*, in the exchequer, that part of a tally which is kept by an officer of the court.

COUNTER-*Guard*, in *Fortification*, is a work raiſed before the point of a baſtion, conſiſting of two long faces parallel to the faces of the baſtion, making a ſaliant angle; they are ſometimes of other ſhapes, or otherwiſe ſituated.

COUNTER-*Light*, or *Counter-jour*, a light oppoſite to any thing, which makes it appear to diſadvantage. A ſingle counter-light is ſufficient to take away all the beauty of a fine painting.

COUNTER-*March*, in military affairs, a change of the face or wings of a battalion, by which means thoſe that were in the front come to be in the rear. It alſo ſignifies returning, or marching back again.

COUNTER-*Mine*, in *War*, a well and gallery drove and ſunk till it meet the enemy's mine, to prevent its effect.

COUNTER-*Paled*, in *Heraldry*, is when the eſcutcheon is divided into twelve pales parted per feſſe, the two colours being counter-changed; ſo that the upper are of one colour and the lower of another.

COUNTER-*Part*, in *Muſic*, denotes one part to be applied to another. Thus the baſs is ſaid to be a counter-part to the treble.

COUNTER-*Paſſant*, in *Heraldry*, is when two lions are in a coat of arms, and the one ſeems to go quite the contrary way from the other.

Counter-Point, in *Muſic*, a term derived from the Latin prepoſition *contra* and the verb *pungere;* becauſe the muſical characters by which the notes in each part are ſignified are placed in ſuch a manner, each with reſpect to each, as to ſhow how the parts anſwer one another. See Composition.

Counter-Pointed (*Contre-pointe*), in *Heraldry*, is when two chevrons in one eſcutcheon meet in the points, the one riſing as uſual from the baſe, and the other inverted falling from the chief; ſo that they are counter to one another in the points. They may alſo be counter-pointed when they are founded upon the ſides of the ſhield, and the points meet that way, called *counter-pointed* in *feſſe*.

COUNTERPOISE, in the manege, is the liberty of the action and ſeat of a horſeman; ſo that in all the motions made by the horſe, he does not incline his body more to one ſide than to the other, but continues in the middle of the ſaddle, being equally on his ſtirrups, in order to give the horſe the proper and reaſonable aids.

COUNTER-potent (*contre-potencé*), in *Heraldry*, is reckoned a fur as well as vaire and ermine; but compoſed of ſuch pieces as repreſent the tops of crutches, called in French *potences*, and in old Engliſh *potents*.

Counter-Proof, in rolling-preſs printing, a print taken off from another freſh printed; which by being paſſed through the preſs, gives the figure of the former, but inverted. To counter-prove, is alſo to paſs a deſign in black lead, or red chalk, through the preſs, after having moiſtened with a ſponge both that and the paper on which the counter-proof is to be taken.

Counter-Quartered (*contre-ecartelé*), in *Heraldry*, denotes the eſcutcheon, after being quartered, to have each quarter again divided into two.

Counter-Saliant, is when two beaſts are borne in a coat leaping from each other directly the contrary way.

Counter-Scarp, in *Fortification*, is properly the exterior talus or ſlope of the ditch; but it is often taken for the covered way and the glacis. In this ſenſe we ſay, the enemy have lodged themſelves in the counterſcarp. Angle of the counter-ſcarp, is that made by two ſides of the counter-ſcarp, meeting before the middle of the curtain.

Counter-Signing, the ſigning the writing of a ſuperior in quality of ſecretary. Thus charters are ſigned by the king, and counter-ſigned by a ſecretary of ſtate, or lord chancellor.

Counter-Time, in the manege, is the defence or reſiſtance of a horſe that interrupts his cadence, and the meaſure of his manege, occaſioned either by a bad horſeman or by the malice of a horſe.

Counter, is alſo the name of a counting-board in a ſhop, and of a piece of metal with a ſtamp on it, uſed in playing at cards.

Counter of a Horſe, that part of a horſe's forehand which lies between the ſhoulders and under the neck.

Counters in a ſhip are two. 1. The hollow arching from the gallery to the lower part of the ſtraight piece of the ſtern, is called the *upper-counter*. 2. The lower counter is between the tranſom and the lower part of the gallery.

Counter, is alſo the name of two priſons in the city of London, viz. the Poultry and Woodſtreet.

COUNTORS, Countours, or Counters, has been uſed for ſerjeants at law, retained to defend a cauſe, or to ſpeak for their client in any courſe of law.

It is of theſe Chaucer ſpeaks:

> —— A ſheriff had he been, and a contour,
> Was nowhere ſuch a worthy vavaſour.

They were anciently called *ſerjeant contours*.

COUNTRIES, among the miners, a term or appellation they give to their works under ground.

COUNTRY, among geographers, is uſed indifferently to denote either a kingdom, province, or leſſer diſtrict. But its moſt frequent uſe is in contradiſtinction to town.

Country-Dance is of Engliſh origin, though now tranſplanted into almoſt all the countries and courts of Europe. There is no eſtabliſhed rule for the compoſition of tunes to this dance, becauſe there is in muſic no kind of time whatever which may not be meaſured by the motions common in dancing; and there are few ſong tunes of any note within the laſt century, that have not been applied to country-dances.

COUNTY, in *Geography*, originally ſignified the territory of a count or earl, but now it is uſed in the ſame ſenſe with ſhire; the one word coming from the French, the other from the Saxon.—In this view, a county is a circuit or portion of the realm; into fifty-two of which the whole land, England and Wales, is divided for its better government and the more eaſy adminiſtration of juſtice.

For the execution of the laws in the ſeveral counties, excepting Cumberland, Weſtmorland, and Durham, every Michaelmas term officers are appointed, under the denomination of *ſheriffs*. Other officers of the ſeveral counties are, a lord-lieutenant, who has the command of the militia of the county; cuſtodes rotulorum, juſtices of peace, bailiffs, high-conſtable, and coroner.

Of the fifty-two counties, there are three of ſpecial note, which are therefore termed *counties palatine*, as Lancaſter, Cheſter, and Durham. See Palatine.

County-Corporate, is a title given to ſeveral cities, or ancient boroughs, on which our monarchs have thought fit to beſtow extraordinary privileges; annexing to them a particular territory, land, or juriſdiction; and making them counties of themſelves, to be governed by their own ſheriffs and magiſtrates.

County-Court, in *Engliſh Law*, a court incident to the juriſdiction of the ſheriff. It is not a court of record, but may hold pleas of debt or damages under the value of 40s. Over ſome of which cauſes theſe inferior courts have, by the expreſs words of the ſtatute of Glouceſter, a juriſdiction totally excluſive of the king's ſuperior courts. For in order to be entitled to ſue an action of treſpaſs for goods before the king's juſticiars, the plaintiff is directed to make affidavit that the cauſe of action does really and *bona fide* amount to 40s. which affidavit is now unaccountably diſuſed, except in the court of exchequer. The ſtatute alſo 43 Eliz. c. 6. which gives the judges in many perſonal actions, where the jury aſſeſs leſs damages than 40s. a power to certify the ſame and abridge the plaintiff of his full coſts, was alſo meant to prevent vexation by litigious plaintiffs; who, for purpoſes of mere oppreſſion, might be inclinable to inſtitute ſuch ſuits in the ſuperior courts for injuries of a trifling value. The county court may alſo hold plea of many real actions, and of all perſonal actions to any amount, by virtue of a ſpecial writ called *juſticies;* which is a writ empowering the ſheriff for the ſake of diſpatch to do the ſame juſtice in this county-court, as might otherwiſe be had at Weſtminſter. The freeholders of the county are the real judges in this court, and the ſheriff is the miniſterial officer. The great conflux of freeholders, which are ſuppoſed always to attend at the county court (which Spelman calls *forum plebeiæ juſtitiæ et theatrum comitivæ poteſtatis*), is the reaſon why all acts of parliament at the end of every ſeſſion were wont to be there publiſhed by the ſheriff; why all outlawries of abſconding offenders are there proclaimed; and why all popular elections which the freeholders are to make, as formerly of ſheriffs and conſervators of the peace, and ſtill of coroners, verderors, and knights of the ſhire, muſt ever be made *in pleno comitatu*, or in full county-court. By the ſtatute 2. Edw. VI. c. 25. no county-court ſhall be adjourned longer than for one month, conſiſting of 28 days. And this was alſo the ancient uſage, as appears from the laws of King Edward the elder; *prepoſitus* (that is the ſheriff) *ad quartam circiter ſeptimanam frequentem populi concionem celebrato; cuique jus dicito; liteſque ſingulas dirimito.* In thoſe times the county-court was a court of great dignity and ſplendour, the biſhop and the ealdorman (or earl), with the principal men of the ſhire, ſitting therein to adminiſter juſtice both in lay and eccleſiaſtical cauſes. But its dignity was much impaired, when the biſhop was prohibited, and the earl neglected to attend it. And, in modern times, as proceedings are removeable from hence into the king's ſuperior courts, by writ of *pone* or *recordare*, in the ſame manner as from hundred-courts and courts-barons; and as the ſame writ of falſe judgment may be had, in nature of a writ of error, this has occaſioned the ſame diſuſe of bringing actions therein.

COUPAR, or CUPAR, *of* ANGUS, a town of Scotland, in the valley of Strathmore, and though deſignated in Angus, by far the greater part is ſituated in the county of Perth. The town is placed on the Iſla, and is divided by a rivulet into two parts; that part which lies ſouth of this rivulet being all that belongs to the county of Angus. The ſtreets are well paved and lighted, and the town has much improved of late years; there is a town-houſe and ſteeple on the ſpot where the priſon of the court of regality ſtood. The linen manufacture is carried on to a conſiderable extent, nearly 200,000 yards of different kinds of cloth being annually ſtamped here. The number of inhabitants in 1793, amounted to 1604. Cupar is diſtant about 12 miles from Perth, and nearly the ſame diſtance from Dundee. The pariſh of Cupar extends about 5 miles in length from ſouth-weſt to north-eaſt, and is from 1 to 2 miles in breadth; it is divided lengthways by an elevated ridge: a conſiderable extent of haugh ground lies on the banks of the Iſla, which is frequently ſwelled by the rains, and lays nearly 600 acres under water. There are ſtill viſible at Cupar, the veſtiges of a Roman camp, ſaid to have been formed by the army of *Agricola* in his 7th expedition. On the center of this camp, Malcolm IV. in 1104, founded and richly endowed an abbey for Ciſtertian monks; from what remains, it muſt have been a houſe of conſiderable magnitude.

COUPAR, or *Cupar*, *of Fife*, a town in Scotland, capital of the county of Fife, about 10 miles weſt of St Andrews; W. Long. 2. 40. N. Lat. 56. 20. It is ſituated on the north bank of the Eden, nearly in the center of the county; it boaſts of great antiquity; the thanes of Fife, from the earlieſt times of which any account has been tranſmitted to us, held here their courts of juſtice; and in the rolls of parliament, aſſembled in the beginning of the reign of King David II. may be ſeen the names of commiſſioners from the royal borough of Cupar. It is governed by a provoſt, 3 bailies, a dean of guild, and 21 counſellors. The revenue of the town amounts to 430l. ſterling per annum. Cupar has the appearance of a neat, clean, well built, thriving town. The ſtreets are well paved, and upwards of one third of the town is newly built. The church is a neat new building, and the ſpire is much admired for its light and elegant appearance. Adjoining to the town-houſe, the gentlemen of the county lately built a room for county meetings, and other apartments. The priſons are on the oppoſite ſide of the town-houſe. In Cupar, and the neighbouring country, a conſiderable quantity of coarſe linens are manufactured; about 500,000 yards are annually ſtamped, the aggregate value of which is nearly 30,000l. ſterling. Population of the town is about 3140. The pariſh of Cupar is an irregular ſquare of 5 miles, divided into two parts by the river Eden, the banks of which are covered with numerous farm houſes, and ornamented with elegant and ſtately villas. *Carſlogie*, the ſeat of Colonel Clephane, is an ancient manſion. *Garlie bank*, the property of James Wemyſs, Eſq. of Winthank, is celebrated for the treaty concluded on the 13th of June 1559, between the duke de Chattelherault, on the part of the queen-regent, and the earl of Argyll commanding the forces of the congregation. The population of the pariſh (including the town of Cupar) in 1793, amounted to 3702; in 1801, there were 4463 inhabitants in the ſame diſtrict.

COUPED, in *Heraldry*, is uſed to expreſs the head, or any limb, of an animal, cut off from the trunk, ſmooth; diſtinguiſhing it from that which is called *eraſſed*, that is, forcibly torn off, and therefore is ragged and uneven.

COUPED, is alſo uſed to ſignify ſuch croſſes, bars, bends, chevrons, &c. as do not touch the ſides of the eſcutcheon, but are, as it were, cut off from them.

COUPEE, a motion in dancing, wherein one leg is a little bent, and ſuſpended from the ground; and with the other a motion is made forwards.

The word in the original French ſignifies a *cut*.

COUPLE CLOSS, in *Heraldry*, the fourth part of a chevron, never borne but in pairs, except there be a chevron between them, ſaith Guillim, though Bloom gives an inſtance to the contrary.

COUPLET, a diviſion of a hymn, ode, ſong, &c.

wherein an equal number, or equal meaſure, of verſes, is found in each part; which diviſions, in odes, are called *ſtrophes*.—Couplet, by an abuſe of the word, is frequently made to ſignify a couple of verſes.

COURAGE, in *Ethics*, is that quality of the mind, derived either from conſtitution or principle, or both, that enables men to encounter difficulties and dangers. See Fortitude.

COURANT, a French term ſynonymous with *current*, and properly ſignifies running. See Current.

Courant, is alſo a term in muſic and dancing; being uſed to expreſs both the tune or air and the dance. With regard to the firſt, *courant* or *currant* is a piece of muſic in triple time: the air of the courant is ordinarily noted in triples of minims; the parts to be repeated twice. It begins and ends when he who beats the meaſure falls his hands; in contradiſtinction from the ſaraband, which ordinarily ends when the hand is raiſed. With regard to dancing, the courant was long the moſt common of all the dances practiſed in England: it conſiſts, eſſentially, of a time, a ſtep, a balance, and a coupee; though it alſo admits of other motions. Formerly they leaped their ſteps; in which point the courant differed from the low dance and pavades. There are ſimple courants and figured courants, all danced by two perſons.

COURAP, the modern name for a diſtemper very common in Java and other parts of the Eaſt Indies. It is a ſort of herpes or itch on the arm pits, groins, breaſt, and face; the itching is almoſt perpetual; and the ſcratching is followed by great pain and a diſcharge of matter, which makes the linen ſtick ſo to the ſkin as not eaſily to be ſeparated without tearing off the cruſt. *Courap* is a general name for any ſort of itch; but this diſtemper is thus called by way of eminence. It is ſo contagious that few eſcape it. For the cure, gentle and repeated purging is uſed, and externally the ſublimate in a ſmall quantity is a good topic.

COURAYER, Peter Francis, a Roman Catholic clergyman, diſtinguiſhed by great moderation, charity, and temper, concerning religious affairs, as well as by learning, was born at Vernon in Normandy, 1681. While canon regular and librarian of the abbey of St Genevieve at Paris, he applied to our archbiſhop Wake for the reſolution of ſome doubts, concerning the epiſcopal ſucceſſion in England, and the validity of our ordinations: he was encouraged to this by the friendly correſpondence which had paſſed between the archbiſhop and M. du Pin of the Sorbonne. The archbiſhop ſent him exact copies of the proper records; and on theſe he built his "Defence of Engliſh Ordinations," which was publiſhed in Holland, in 1727. This expoſed him to a proſecution in his own country; he therefore took refuge in England; where he was well received, and preſented the ſame year by the univerſity of Oxford with a doctor's degree. As it is ſomewhat uncommon for a Roman Catholic clergyman to be admitted to degrees in divinity by Proteſtant univerſities, the curious may be gratified with a ſight of the diploma, and the doctor's letter of thanks, in "The preſent State of the Republic of Letters, for June 1728." In 1736, he tranſlated into French, and publiſhed, "Father Paul's Hiſtory of the Council of Trent," in 2 vols folio, and dedicated it to Queen Caroline; who augmented to 200l. a penſion of 100l. a-year, which he had obtained before from the court. The learned Jer. Markland, in a letter to his friend Bowyer, September 1756, ſays, "Mr Clarke has given me F. Courayer's tranſlation of the Hiſtory of the Council of Trent; with whoſe preface I am ſo greatly pleaſed, that if he be no more a Papiſt in other tenets than he is in thoſe he mentions (which are many, and of the moſt diſtinguiſhing claſs), I dare ſay there are very few conſiderate Proteſtants who are not as good Catholics as he is." His works are many, and all in French: he tranſlated Sleidan's "Hiſtory of the Reformation." He died in 1776, after two days illneſs, at the age of 95; and was buried in the cloiſter of Weſtminſter-abbey. In this will, dated Feb. 3. 1774, he declares, that he "dies a member of the Catholic church, but without approving of many of the opinions and ſuperſtitions which have been introduced into the Romiſh church, and taught in their ſchools and ſeminaries; and which they have inſiſted on as articles of faith, though to him they appear to be not only not founded in truth, but alſo to be highly improbable." And his practice was conformable to this declaration; for at London he conſtantly went to maſs, and at Ealing in the country, whither he often retired, as conſtantly attended the ſervice of the pariſh church; declaring at all times, that he "had great ſatisfaction in the prayers of the church of England."

COURBARIL. See Hymenea.

COURIER, or Currier, (from the French *courir*, "to run,") a meſſenger ſent poſt, or expreſs, to carry diſpatches.

The ancients too, had their couriers. We meet with two kinds: 1. Thoſe who ran on foot, called by the Greeks *hemerodromi*, q. d. "couriers of a day." Pliny, Corn. Nepos, and Cæſar, mention ſome of theſe who would run 20, 30, 36, and in the circus even 40 leagues per day. 2. Riding couriers (*curſores equitantes*), who changed horſes as the modern couriers do.

Xenophon attributes the firſt couriers to Cyrus. Herodotus ſays they were very ordinary among the Perſians, and that there was nothing in the world more ſwift than theſe kind of meſſengers. "That prince (ſays Xenophon) examined how far a horſe would go in a day; and built ſtables, at ſuch diſtances from each other, where he lodged horſes, and perſons to take care of them; and at each place kept a perſon always ready to take the packet, mount a freſh horſe, and forward it to the next ſtage; and thus quite through his empire."

But it does not appear that either the Greeks or Romans had any regular fixed couriers till the time of Auguſtus: under that prince they travelled in cars; though it would appear that they afterwards went on horſeback. Under the weſtern empire they were called *viatores;* and under that of Conſtantinople, *curſores:* whence the modern name. See Post.

COURLAND, a duchy ſituated between E. Long. 21. 26. and between N. Lat. 56. 30. and 57. 20. It is bounded by the river Dwina, which divides it from Livonia, on the north; by Lithuania, on the eaſt; by Samogitia, on the ſouth, and by the Baltic ſea on the weſt; being 120 miles long and 30 broad. This duchy was formerly independent, and elected their own duke; but it is now ſubject to Ruſſia.

COURSE (*route*), in *Navigation*, the angle contained between the neareſt meridian and that point of the compaſs upon which a ſhip ſails in any particular direction.

COURSE, in *Architecture*, denotes a continued range of ſtones, level, or of the ſame height, throughout the whole length of the building; and not interrupted by any aperture. It forms a parapet to the intermediate ſpace between the body of the building and the wings.

Course of Plinths, is the continuity of a plinth of ſtone or plaſter in the face of a building; to mark the ſeparation of the ſtories.

COURSE is alſo uſed for the time ordinarily ſpent in learning the principles of a ſcience, or the uſual points and queſtions therein. Thus, a ſtudent is ſaid to have finiſhed his courſe in the humanity, in philoſophy, &c.

COURSE is alſo uſed for the elements of an art exhibited and explained, either in writing or by actual experiment. Hence our courſes of philoſophy, anatomy, chemiſtry, mathematics, &c. probably ſo called as going throughout or running the whole length or courſe of the arts, &c.

COURSES, a name by which the principal ſails of a ſhip are diſtinguiſhed, viz. the main-ſail, the fore-ſail, and the mizen: the mizen ſtay-ſail and fore-ſail are alſo ſometimes comprehended in this denomination; as are the main ſtay-ſails of all brigs and ſchooners. See SAIL.

COURSING, among ſportſmen. There are three ſeveral ſorts of courſes with grehounds: 1. At the hare; 2. At the fox; and, 3. At the deer.

For the *deer*, there are two ſorts of courſes; the one in the paddock, the other either in the foreſt or the purlieu. For the paddock courſe, there muſt be the grehound and the terrier, and the mongrel grehound, whoſe buſineſs it is to drive away the deer before the grehounds are ſlipped; a brace or a leaſh are the uſual number ſlipped at a time, ſeldom at the utmoſt more than two brace. In courſing the deer in the foreſt or purlieu, there are two ways in uſe: the one is courſing from wood to wood; and the other, upon the lawns cloſe by the keeper's lodge. In the courſing from wood to wood, the way is to throw in ſome young hounds into the wood to bring out the deer; and if any deer come out that is not weighty, or a deer or antler which is buck, ſore, or ſorrel, then you are not to ſlip your grehounds, which are held at the end of the wood, where the keepers, who can gueſs very well on theſe occaſions, expect that the deer will come out. If a proper deer come out, and it is ſuſpected that the brace or leaſh of grehounds ſlipped after him will not be able to kill him, it is proper to waylay him with a couple of freſh grehounds.

The courſing upon the lawn is the moſt agreeable of all other ways. When the keeper has notice of this, he will lodge a deer for the courſe; and then, by coming under the wind, the grehounds may be brought near enough to be ſlipped for a fair courſe.

The beſt method of courſing the *hare*, is to go out and find a hare ſitting; which is eaſily done in the ſummer, by walking acroſs the lands, either ſtubble, fallow, or corn grounds, and caſting the eye up and down: for in ſummer they frequent thoſe places for fear of the ticks, which are common in the woods at that ſeaſon; and in autumn the rains falling from the trees offend them. The reſt of the year there is more trouble required; as the buſhes and thickets muſt be beat to rouſe them, and oftentimes they will lie ſo cloſe, that they will not ſtir till the pole almoſt touches them: the ſportſmen are always pleaſed with this, as it promiſes a good courſe. If a hare lies near any cloſe or covert, and with her head that way, it is always to be expected that ſhe will take to that immediately on being put up; all the company are therefore to ride up, and put themſelves between her and the covert before ſhe is put up, that ſhe may take the other way, and run upon open ground. When a hare is put up, it is always proper to give her ground, or *law*, as it is called; that is, to let her run 12 ſcore yards, or thereabouts, before the grehounds are ſlipped at her; otherwiſe ſhe is killed too ſoon, the greater part of the ſport is thrown away, and the pleaſure of obſerving the ſeveral turnings and windings that the creature will make to get away is all loſt. A good ſportſman had rather ſee a hare ſave herſelf after a fair courſe, than ſee her murdered by the grehounds as ſoon as ſhe is up.

In courſing the *fox*, no other art is required, than ſtanding cloſe, and in a clear wind, on the outſide of ſome grove where it is expected he will come out; and when he is come out, he muſt have head enough allowed him, otherwiſe he will return back to the covert. The ſloweſt grehound will be able to overtake him, after all the odds of diſtance neceſſary; and the only danger is the ſpoiling the dog by the fox, which too frequently happens. For this reaſon, no grehound of any value ſhould be run at this courſe; but the ſtrong, hard, bitter dogs, that will ſeize any thing.

The laws of courſing eſtabliſhed by the duke of Norfolk, and other ſportſmen of the kingdom of England, are theſe:

1. He that is choſen fewterer or letter-looſe of the dogs, ſhall receive the grehounds matched to run together into his leaſh as ſoon as he comes into the field; he is to march next to the hare-finder, or him who is to ſtart the hare, until he come to the form; and no horſeman or footman is to go before or ſideways, but all ſtraight behind, for the ſpace of about 40 yards. 2. A hare ought never to be courſed with more than a brace of grehounds. 3. The hare-finder is to give the hare three ſohoes before he puts her up from her form or ſeat, to the end that the dogs may be prepared and attend her ſtarting. 4. If there be not a particular danger of loſing the hare, ſhe ſhould have about twelve ſcore yards law. 5. The dog that gives the firſt turn, if after that there be neither cote, ſlip, nor wrench, wins the wager. 6. A go-by, or bearing the hare, is counted equivalent to two turns. 7. If either dog turns the hare, he that leads to the laſt covert wins. 8. If any dog turns the hare, ſerves himſelf, and turns her again, it is as much as a cote, and a cote is eſteemed as much as two turns. 9. If all the courſe be equal, he that bears the hare ſhall win; and if he be not borne, the courſe

ſhall then be judged *dead*. 10. If a dog take a fall in his courſe, and yet perform his part, he may challenge the advantage of a turn more than he gave. 11. If a dog turn the hare, ſerve himſelf, and give divers cotes, and yet in the end ſhall ſtand ſtill in the field, the other dog, if he turns home to the covert, although he gives no other, ſhall be adjudged to win the wager. 12. If by misfortune a dog be rid over in the courſe, that courſe ſhall be adjudged void, and he that did the miſchief is to make reparation to the owner. 13. If a dog gives the firſt and laſt turn, and there be no other advantage betwixt them, he that gives the odd turn wins. 14. A cote is when a grehound goes endways by the ſide of his fellow, and gives the hare a turn. 15. A cote ſerves for two turns, and two trippings or jerkings for a cote; and if the hare turns not quite about, ſhe only *wrencheth*, in the ſportſman's phraſe. 16. If there be no cotes given by either of the grehounds, but one ſerves the other at turning, then he that gives the moſt turns wins the wager. 17. Sometimes a hare does not turn, but wrenches; for ſhe does not turn, except ſhe turns as it were round. In theſe caſes, two wrenches ſtand for one turn. 18. He that comes in firſt at the death of the hare takes her up, and ſaves her from breaking; he cheriſhes the dogs, and cleanſes their mouths from the wool; he is adjudged to have the hare for his pains. 19. Finally, thoſe who are judges for the leaſh, muſt give their judgment before they depart out of the field, or elſe it is not to ſtand as valid.

COURT, an appendage to a houſe or habitation; conſiſting of a piece of ground incloſed with walls, but open upwards.

Court is alſo uſed for the palace or place where a king or ſovereign prince reſides.

Court, in a law ſenſe, is defined to be a place wherein juſtice is judicially adminiſtered. And, as, by our excellent conſtitution, the ſole executive power of the laws is veſted in the perſon of the king, it will follow that all courts of juſtice, which are the medium by which he adminiſters the laws, are derived from the power of the crown. For whether created by act of parliament or letters patent, or ſubſiſting by preſcription (the only methods by which any court of judicature can exiſt), the king's conſent in the two former is expreſsly, and in the latter impliedly, given. In all theſe courts, the king is ſuppoſed in contemplation of law to be always preſent; but as that is in fact impoſſible, he is there repreſented by his judges, whoſe power is only an emanation of the royal prerogative.

Blackſtone's Comment.

For the more ſpeedy, univerſal, and impartial adminiſtration of juſtice between ſubject and ſubject, the law hath appointed a prodigious variety of courts, ſome with a more limited, others with a more extendſive juriſdiction; ſome conſtituted to inquire only, others to hear and determine; ſome to determine in the firſt inſtance, others upon appeal and by way of review. See Law, N° xcviii. xcix. c. cxli. clvi. clvii. clviii. and the reſpective articles in the order of the alphabet. One diſtinction may be here mentioned, that runs throughout them all; viz. that ſome of them are courts *of record*, others *not of record*. A court of record is that where the acts and judicial proceedings are enrolled in parchment for a perpetual memorial and teſtimony: which rolls are called the *records of the court*, and are of ſuch high and ſupereminent authority, that their truth is not to be called in queſtion. For it is a ſettled rule and maxim, that nothing ſhall be averred againſt a record, nor ſhall any plea, or even proof, be admitted to the contrary. And if the exiſtence of a record be denied, it ſhall be tried by nothing but itſelf; that is, upon bare inſpection whether there be any ſuch record or not; elſe there would be no end of diſputes. But if there appears any miſtake of the clerk in making up ſuch record, the court will direct him to amend it. All courts of record are the king's courts in right of his crown and royal dignity, and therefore no other court hath authority to fine or impriſon: ſo that the very erection of a new juriſdiction with power of fine or impriſonment, makes it inſtantly a court of records.—A court not of record is the court of a private man; whom the law will not intruſt with any diſcretionary power over the fortune or liberty of his fellow ſubjects. Such are the courts-baron incident to every manor, and other inferior juriſdictions; where the proceedings are not enrolled or recorded; but as well their exiſtence as the truth of the matters therein contained ſhall, if diſputed, be tried and determined by a jury. Theſe courts can hold no plea of matters cognizable by the common law, unleſs under the value of 40s.; nor of any forcible injury whatſoever, nor having any proceſs to arreſt the perſon of the defendant.

In every court there muſt be at leaſt three conſtituent parts, the *actor*, *reus*, and *judex*: the *actor*, or plaintiff, who complains of an injury done; the *reus*, or defendant, who is called upon to make ſatisfaction for it; and the *judex*, or judicial power, which is to examine the truth of the fact, to determine the law ariſing upon that fact, and, if any injury appears to have been done, to aſcertain, and by its officers to apply the remedy. It is alſo uſual in the ſuperior courts to have attorneys, and advocates or counſel, as aſſiſtants. See Attorney and Counsel.

Court-Baron, in *Engliſh Law*, a court incident to every manor in the kingdom, to be holden by the ſteward within the ſaid manor. This court-baron is of two natures: the one is a cuſtomary court, appertaining entirely to the copyholders, in which their eſtates are transferred by ſurrender and admittance, and other matters tranſacted relative to their tenures only. The other is a court of common law, and it is the court of the *barons*, by which name the freeholders were ſometimes anciently called: for that it is held before the freeholders who owe ſuit and ſervice to the manor, the ſteward being rather the regiſter than the judge. Theſe courts, though in their nature diſtinct, are equally confounded together. The court we are now conſidering, viz. the freeholder's court, was compoſed of the lord's tenants, who were the *pares* of each other, and were bound by their feodal tenure to aſſiſt their lord in the diſpenſation of domeſtic juſtice. This was formerly held every three weeks; and its moſt important buſineſs is to determine, by writ of right, all controverſies relating to the right of lands within the manor. It may alſo hold plea of any perſonal actions, of debt, treſpaſs on the caſe, or the like, where the debt or damages do not amount to 40s. Which is the ſame ſum, or three marks, that bounded the juriſdiction of the ancient Gothic courts in their loweſt inſtance, or *fierding courts*, ſo called becauſe four were inſtituted within every ſuperior diſtrict or hundred. But the proceedings on a writ of right may be removed into the county-court by a precept from the ſheriff called a *tolt*, *quia tollit atque eximit cauſam è curia baronum*. And the proceedings in all other actions may be removed into the ſuperior courts by the king's writs of *pone*, or *accedas ad curiam*, according to the nature of the ſuit. After judgment given, a writ alſo of *falſe judgment* lies to the courts at Weſtminſter to rehear and review the cauſe, and not a writ of *error;* for this is not a court of record; and therefore, in ſome of theſe writs of removal, the firſt direction given is to cauſe the plaint to be recorded, *recordari facias loquelam*.

COURT-*Martial*, a court appointed for the puniſhing offences in officers, ſoldiers, and ſailors, the powers of which are regulated by the mutiny-bill.

For other courts, ſee ADMIRALTY, ARCHES, BENCH, CHANCERY, CHIVALRY, *Common-Pleas*, COUNTY, DUCHY, ECCLESIASTICAL, FACULTY, FOREST, HUSTINGS, LEET, LEGATE, MAYOR, PIEPOUDRE, PREROGATIVE, REQUESTS, STANNARY, *Star-Chamber*, UNIVERSITY, &c.

COURTESY, or CURTESY, *of England;* a certain tenure whereby a man marrying an heireſs ſeized of lands of fee-ſimple, or fee-tail general, or ſeized as heir of the tail ſpecial, and getteth a child by her that cometh alive into the world, though both it and his wife die forthwith; yet, if ſhe were in poſſeſſion, he ſhall keep the land during his life, and is called *tenant per legem Angliæ*, "or tenant by the courteſy of England;" becauſe this privilege is not allowed in any country except Scotland, where it is called *curialitas Scotiæ*.

COURTESAN, a woman who proſtitutes herſelf for hire, eſpecially to people of ſuperior rank. Laïs the famous Theban courteſan, ſtands on record for requiring no leſs than 10,000 crowns for a ſingle night. Of all places in the world, Venice is that where courteſans abound the moſt. It is now 300 years ſince the ſenate, which had expelled them, was obliged to recal them; in order to provide for the ſecurity of women of honour, and to keep the nobles employed, leſt they ſhould turn their heads to make innovations in the ſtate.

COURTRAY, a town of the Auſtrian Netherlands, ſituated on the river Lys, about 23 miles ſouth-weſt of Ghent, and 14 eaſt of Ypres. E. Long. 3. 10. N. Lat. 50. 48.

COUSIN, a term of relation between the children of brothers and ſiſters, who in the firſt generation are called *couſin-germans*, in the ſecond generation, *ſecond-couſins*, &c. If ſprung from the relations of the father's ſide, they are denominated *paternal* couſins; if on the mother's, *maternal*.

The word is ordinarily derived from *conſanguineus;* though Menage brings it from *congenius*, or *congeneus*, q. d. *ex eodem genere*.

In the primitive times, it was allowed couſin-germans to marry, to prevent their making alliances in heathen families: but Theodoſius the Great prohibited it under pain of death; on pretence that they were, in ſome ſort, brothers and ſiſters with regard to each other.

COUSIN, *John*, a celebrated French painter, who excelled in painting on glaſs. His picture of the Laſt Judgment, in the veſtry of the Minims of the Wood of Vincennes, is much admired. He was alſo a good ſculptor. He wrote ſeveral works on geometry and perſpective; and died after the year 1689.

COUSU, in *Heraldry*, ſignifies a piece of another colour or metal placed in the ordinary, as if it were ſewed on, as the word imports. This is generally of colour upon colour, or metal upon metal, contrary to the general rule of heraldry.

COUTANCES, a port town of Normandy, and capital of Coutantin, in W. Long. 1. 32. N. Lat. 49. 10. This town, anciently called *Conſtantia* or *Coſedia*, is pleaſantly ſituated among meadows and rivulets about five miles diſtant from the ſea. By the remains of a Roman aqueduct, and other ancient ruins, it appears to be a place of great antiquity. It is the ſee of a biſhop, ſuffragan of Rome; and has a magnificent cathedral, eſteemed one of the fineſt pieces of Gothic architecture in Europe. The trade of this town is very inconſiderable, and the fortifications are quite demoliſhed. They have ſeveral religious houſes, and two parochial churches.

COUTHUTLAUGH, from the Saxon *couth*, "knowing," and *utlaugh*, "outlaw;" he that wittingly receives a man outlawed, and cheriſhes or conceals him: for which offence he was in ancient times ſubject to the ſame puniſhment with the outlaw himſelf.

COVERT, in *Heraldry*, denotes ſomething like a piece of hanging, or a pavilion falling over the top of a chief or other ordinary, ſo as not to hide, but only to be a covering to it.

COW. See BOS, MAMMALIA *Index*.

Cow-Burner. See BUPRESTIS, ENTOMOLOGY *Index*.

Sea-Cow. See TRICHECUS, MAMMALIA *Index*.

Cow-Itch, or *Couhage*. See COUHAGE and DOLICHOS, BOTANY *Index*.

Cow's-Lip. See PRIMULA, BOTANY *Index*.

COWARD, in *Heraldry*, a term given to a lion borne in an eſcutcheon with his tail doubled, or turned in between his legs.

COWEL, DR JOHN, a learned and eminent civilian, born about the year 1554. In 1607 he compiled a Law Dictionary, which gave great offence to Sir Edward Coke and the common lawyers: ſo that they firſt accuſed him to James I. as aſſerting that the king's prerogative was in ſome caſes limited; and when they failed in that attempt, they complained of him to the houſe of commons, as a betrayer of the rights of the people, by aſſerting that the king was not bound by the laws; for which he was committed to cuſtody, and his book publicly burnt. He alſo publiſhed *Inſtitutiones Juris Anglicani*, in the manner of Juſtinian's Inſtitutes; and died in the operation for the ſtone, in 1611.

COWES, a town and harbour on the north-eaſt coaſt of the Iſle of Wight, in Hampſhire. It has no market, but is the beſt place for trade in the whole iſland; but as it lies low, the air is accounted unhealthy.

It is eight miles ſouth-eaſt of Portſmouth. W. Long. 1. 25. N. Lat. 50. 45.

COWL, or Coul, a ſort of monkiſh habit worn by the Bernardines and Benedictines. The word is formed from *cucullus*, by confounding the two firſt ſyllables into one, as being the ſame twice repeated.—There are two kinds of cowls: the one white, very large, worn in ceremony, and when they aſſiſt at the office; the other black, worn on ordinary occaſions, in the ſtreets, &c.

F. Mabillon maintains the coul to be the ſame thing in its origin with the ſcapular. The author of the apology of the emperor Henry IV. diſtinguiſhes two forms of couls: the one is a gown reaching to the feet, having ſleeves, and a capuchin, uſed in ceremonies; the other a kind of hood to work in, called alſo a *ſcapular*, becauſe it only covers the head and ſhoulders.

COWLEY, Abraham, an eminent poet, was born at London in 1618. His father, who was a grocer, dying before he was born, his mother procured him to be admitted a king's ſcholar at Weſtminſter. His firſt inclination to poetry aroſe on his lighting on Spenſer's Fairy Queen, when he was but juſt able to read; and this inclination ſo far improved in him, that at 13 he began to write ſeveral poems; a collection of which was publiſhed in 1613, when he was but 15. He has been repreſented as poſſeſſed of ſo bad a memory that his teachers could never bring him to retain the ordinary rules of grammar. But the fact was, as Dr Johnſon notices, not that he could not learn or retain the rules; but that being able to perform his exerciſes without them, he ſpared himſelf the labour. In 1636 he was elected a ſcholar of Trinity college, Cambridge, and removed to that univerſity. Here he went through all his exerciſes with a remarkable degree of reputation; and at the ſame time muſt have purſued his poetical turn with great eagerneſs, as it appears that the greateſt part of his poems were written before he left that univerſity. He had taken his degree of maſter of arts before 1643, when, in conſequence of the turbulence of the times, he, among others, was ejected from the college; whereupon, retiring to Oxford, he entered himſelf of St John's College; and that very year, under the denomination of a *ſcholar of Oxford*, publiſhed a ſatire called the Puritan and the Papiſt. It is apparent, however, that he did not remain very long at Oxford; for his zeal to the royal cauſe engaging him in the ſervice of the king, who was very ſenſible of his abilities, and by whom he was frequently employed, he attended his majeſty in many of his journeys and expeditions, and gained not only that prince's eſteem, but that of many other great perſonages, and in particular of Lord Falkland, one of the principal ſecretaries of ſtate.

During the heat of the civil war, he was ſettled in the earl of St Alban's family; and when the queen-mother was obliged to retire into France, he accompanied her thither, laboured ſtrenuouſly in the affairs of the royal family, undertook ſeveral very dangerous journeys on their account, and was the principal inſtrument in maintaining an epiſtolary correſpondence between the king and queen, whoſe letters he ciphered and deciphered with his own hand. His poems, entitled The Miſtreſs, were publiſhed at London in 1647; and his comedy called The Guardian, afterwards altered and publiſhed under the title of Cutter of Coleman-ſtreet, in 1650. In 1656 it was thought proper by thoſe on whom Mr Cowley depended that he ſhould come over into England, and, under pretence of privacy and retirement, ſhould give notice of the poſture of affairs in this nation. Upon his return he publiſhed a new edition of all his poems, conſiſting of four parts; viz. I. Miſcellanies. II. The Miſtreſs, or Several Copies of Love-verſes. III. Pindaric Odes, written in imitation of the ſtyle and manner of Pindar. IV. Davideis, a ſacred poem of the troubles of David, in four books.

Soon after his arrival, however, he was ſeized, in the ſearch after another gentleman of conſiderable note in the king's party; but although it was through miſtake that he was taken, yet when the republicans found all their attempts of every kind to bring him over to their party proved ineffectual, he was committed to a ſevere confinement, and it was even with conſiderable difficulty that he obtained his liberty; when, venturing back to France, he remained there, in his former ſituation, till near the time of the king's return. During his ſtay in England he wrote his Two Books of Plants, publiſhed firſt in 1662; to which he afterwards added four books more; and all ſix, together with his other Latin poems, were printed at London in 1678. It appears by Mr Wood's *Faſti Oxonienſes*, that our poet was created doctor of phyſic at Oxford, December 2. 1657.

Soon after the Reſtoration he became poſſeſſed of a very competent eſtate, through the favour of his principal friends the duke of Buckingham and the earl of St Alban's; and being now upwards of 40 years of age, he took up a reſolution to paſs the remainder of a life which had been a ſcene of tempeſt and tumult, in that ſituation which had ever been the object of his wiſhes, a ſtudious retirement. His eagerneſs to get out of the buſtle of a court and city made him leſs careful than he might have been in the choice of a healthful habitation in the country; by which means he found his ſolitude from the very beginning ſuit leſs with the conſtitution of his body than with his mind. His firſt rural reſidence was at Barn Elms, a place which, lying low, and being near a large river, was ſubject to a variety of breezes from land and water, and liable in the winter-time to great inconvenience from the dampneſs of the ſoil. The conſequence of this Mr Cowley too ſoon experienced, by being ſeized with a dangerous and lingering fever. On his recovery from this he removed to Chertſey, a ſituation not much more healthy, where he had not been long before he was ſeized with another conſuming diſeaſe. Having languiſhed under this for ſome months, he at length got the better of it, and ſeemed pretty well recovered from the bad ſymptoms, when one day in the heat of ſummer 1667, ſtaying too long in the fields to give ſome directions to his labourers, he caught a moſt violent cold, which was attended with a defluxion and ſtoppage in his breaſt; and for want of timely care, by treating it as a common cold, and refuſing advice till it was paſt remedy, he departed this life on the 28th of July in that year, being the 49th of his age; and on the 3d of Auguſt following, he was interred in Weſtminſter-abbey, near the aſhes of Chaucer, and his beloved Spenſer. He was a man of a very amiable character, as well as an admirable genius. King Charles II. on the news of his death, declared "that Mr Cowley had not left a better man behind him in England." A monument was erected to his memory by George Villiers duke of Buckingham in 1675.

Beſides the works already mentioned, Mr Cowley wrote, among other things, A Propoſition for the Advancement of Experimental Philoſophy; A Diſcourſe by way of Viſion concerning the Government of Oliver Cromwell; and Several Diſcourſes by way of Eſſays in Proſe and Verſe. Mr Cowley had deſigned alſo a Diſcourſe concerning Style, and a Review of the Principles of the Primitive Chriſtian Church, but was prevented by death. A ſpurious piece, entitled The Iron Age, was publiſhed under Mr Cowley's name during his abſence; and, in Mr Dryden's Miſcellany Poems, we find A Poem on the Civil War, ſaid to be written by our author, but not extant in any edition of his works. An edition of his works was publiſhed by Dr Spratt, afterwards biſhop of Rocheſter, who alſo prefixed to it an account of the author's life, The reverend editor mentions, as very excellent of their kind, Mr Cowley's letters to his Friends; none of which, however, were publiſhed.

The moral character of Mr Cowley appears, from every account of it, to have been very excellent; "He is repreſented by Dr Spratt (ſays Dr Johnſon), as the moſt amiable of mankind; and this poſthumous praiſe may be ſafely credited, as it has never been contradicted by envy or by faction."

As a poet, his merits have been variouſly eſtimated. Lord Clarendon has ſaid he made a flight above all men; Addiſon, in his account of the Engliſh poets, that he improved upon the Theban bard; the duke of Buckingham upon his tomb-ſtone, that he was the Engliſh Pindar, the Horace, the Virgil, the delight, the glory of his times. And with reſpect to the harſhneſs of his numbers, the eloquent Spratt tells us, that if his verſes in ſome places ſeem not as ſoft and flowing as one would have them, it was his choice and not his fault.

"Such (ſays Mr Knox) is the applauſe laviſhed on a writer who is now ſeldom read. That he could ever be eſteemed as a pindaric poet is a curious literary phenomenon. He totally miſtook his own genius when he thought of imitating Pindar. He totally miſtook the genius of Pindar, when he thought his own incoherent ſentiments and numbers bore the leaſt reſemblance to the wild yet regular ſublimity of the Theban. He neglected even thoſe forms, the ſtrophe, antiſtrophe, and epode, which even imitative dulneſs can copy. Sublime imagery, vehement pathos, poetic fire, which conſtitute the eſſence of the Pindaric ode, are incompatible with witty conceits, accurate antitheſes and vulgar expreſſion. All theſe imply the coolneſs of deliberate compoſition, or the meanneſs of a little mind; both of them moſt repugnant to the truly Pindaric ode, in which all is rapturous and noble. Wit of any kind would be improperly diſplayed in ſuch compoſition: but to increaſe the abſurdity, the wit of Cowley is often falſe. That he had a taſte for Latin poetry, and wrote in it with elegance, the well known epitaph on himſelf, upon his retirement, and an admirable imitation of Horace, are full proofs. But ſurely his rhetorical biographer makes uſe of the figure hyperbole, when he affirms that Cowley has excelled the Romans themſelves. He was inferior to many a writer of leſs name in the *Muſæ Anglicanæ*. But ſtill he had great merit; and I muſt confeſs I have read his Latin verſes with more pleaſure than any of his Engliſh can afford." *Eſſays*, vol. ii. p. 363—365.

To Cowley's compoſitions in proſe Mr Knox hath paid a very honourable teſtimony. He ſays, that in this department he is an elegant, a pleaſing, a judicious writer; and that it is much to be lamented that he did not devote a greater part of his time to a kind of writing which appeared natural to him, and in which he excelled.

Dr Joſeph Warton obſerves, that it is no caricature of Cowley to repreſent him as being poſſeſſed of a ſtrained affectation of ſtriving to be witty upon all occaſions. "It is painful (adds this excellent critic), to cenſure a writer of ſo amiable a mind, ſuch integrity of manners, and ſuch ſweetneſs of temper. His fancy was brilliant, ſtrong, and ſprightly; but his taſte falſe and unclaſſical, even though he had much learning."

Dr Beattie has characteriſed Cowley in the following terms. "I know not whether any nation ever produced a more ſingular genius than Cowley. He abounds in tender thoughts, beautiful lines, and emphatical expreſſions. His wit is inexhauſtible, and his learning extenſive; but his taſte is generally barbarous, and ſeems to have been formed upon ſuch models as Donne, Martial, and the worſt parts of Ovid: nor is it poſſible to read his longer poems with pleaſure, while we retain any reliſh for the ſimplicity of ancient compoſition. If this author's ideas had been fewer, his conceits would have been leſs frequent; ſo that in one reſpect learning may be ſaid to have hurt his genius. Yet it does not appear that Greek and Latin did him any harm; for his imitations of Anacreon are almoſt the only parts of him that are now remembered or read. His Davideis, and his tranſlations of Pindar, are deſtitute of harmony, ſimplicity, and every other claſſical grace."

But the works of this celebrated poet have been nowhere ſo amply criticiſed as in his Life by Dr Johnſon. After a particular examination of the different pieces, the Doctor, in taking a general review of Cowley's poetry, obſerves, that he wrote with abundant fertility, but negligent or unſkilful ſelection; with much thought, but with little imagery; that he is never pathetic, and rarely ſublime, but always either ingenious or learned, either acute or profound." Of his proſe he ſpeaks with great approbation. "No author (ſays he) ever kept his verſe and his proſe at a greater diſtance from each other. His thoughts are natural, and his ſtyle has a ſmooth and placid equality, which has never yet obtained its due commendation. Nothing is far ſought or hard laboured; but all is eaſy without feebleneſs, and familiar without groſſneſs." Upon the whole, he concludes as follows; "It may be affirmed, without any encomiaſtic fervour, that he brought to his poetic labours a mind replete with learning, and that his paſſages are embelliſhed with all the ornaments which books could ſupply; that he was the firſt who imparted to Engliſh numbers the enthuſiaſm of the greater ode and the gaiety of the leſs; that he was qualified for ſprightly ſallies and for lofty flights; that he was among thoſe who freed tranſlation from ſervility, and, inſtead of following his author at a diſtance, walked by his ſide; and that though he had left verſification yet improvable, he left likewiſe from time to time ſuch ſpecimens of excellence as enabled ſucceeding poets to improve it."

So many of Cowley's productions being now eſteemed ſcarcely worthy of a peruſal, while others of them are diſtinguiſhed by their beauty, Dr Hurd (the preſent biſhop of Worceſter), thought proper to make a ſelection of them, which he publiſhed in 1772, under the title of Select Works of Mr Abraham Cowley, in two volumes; with a preface and notes by the Editor.

COWPER, William, a diſtinguiſhed modern poet, was born at Berkhamſtead in Hertfordſhire in the year 1732. His father, who was rector of the pariſh, was nephew to Lord Chancellor Cowper. Mr Cowper was educated at Weſtminſter ſchool; and in that celebrated ſeminary he acquired his claſſical knowledge. But it would appear from his poem, entitled "*Tirocinium*," that the impreſſions which he then received were not favourable to this ſyſtem of education, and gave him a permanent diſlike to public ſchools. Through family intereſt, the honourable and lucrative place of clerk to the houſe of lords had been provided for him; he was, therefore entered at the Temple for the ſtudy of the law, in order to qualify him for it. In this ſituation his manners were amiable and decent; and though it is probable that he did not refuſe to indulge in thoſe pleaſures which are uſual among young men ſimilarly ſituated, yet there ſeems no reaſon to ſuppoſe that he had any peculiar cauſes for ſelf-accuſation. His natural diſpoſition was timid and diffident; his ſpirits were conſtitutionally weak, even to the borders of abſolute unfitneſs for worldly concerns; ſo that when the time came for aſſuming that poſt to which he had been deſtined, he ſhrunk with ſuch terror from the idea of making his appearance before the moſt auguſt aſſembly in the nation, that, after a violent ſtruggle with himſelf, he actually reſigned the employment, and with it all his proſpects in life. It appears to have been under the agitation of mind which this circumſtance occaſioned, and which threw him into a ſerious illneſs, that he was led to a deep conſideration of his ſtate in a religious view; and from the ſyſtem he had adopted, this courſe of reflection excited in him the moſt alarming and diſtreſsful apprehenſions. In vain did his theological friends ſet before him thoſe encouraging views which the theory of Chriſtian juſtification is calculated to preſent, and which to many is the ſource of a confidence perhaps as exceſſive as their former fears; the natural diſpoſition of his mind fitted it to receive all the horrors, without the conſolations of his faith. We are told, that "the terror of eternal judgment overpowered and wholly diſordered his faculties; and he remained ſeven months in a continual expectation of being inſtantly plunged into final miſery." In this ſhocking condition he became the ſubject of medical care, and he was placed in the receptacle for lunatics kept by Dr Cotton of St Alban's, an amiable and worthy phyſician, and the author of ſome well-known poems. At length he recovered a degree of ſerenity; but his mind had acquired that indelible tinge of melancholy by which it was ever after characteriſed, and which rendered his whole life little more than a ſucceſſion of intervals of comfort between long paroxiſms of ſettled deſpondency. It is unneceſſary to follow him through all his ſcenes of retirement. Part of his time was ſpent at the houſe of his relation, Earl Cowper, at Cole-green; and part at Huntingdon, with his intimate friend the reverend Mr Unwin. After the death of the latter, he removed with his widow to Olney in Buckinghamſhire, which was thenceforth the principal place of his reſidence. The affectionate intimacy he enjoyed with this lady is ſtrongly expreſſed in the following lines, which have probably been underſtood by moſt readers as expreſſive of a conjugal union:

—Witneſs, dear companion of my walks,
Whoſe arm this twentieth winter I perceive
Faſt lock'd in mine, with pleaſure ſuch as love
Confirm'd by long experience of thy worth
And well-tried virtues could alone inſpire—
Witneſs a joy that thou haſt doubled long.
Taſk, Book I.

At Olney he contracted a cloſe friendſhip with the reverend Mr Newton, then miniſter there, and ſince rector of St Mary Woolnoth, London, whoſe religious opinions were in uniſon with his own. When Mr Newton publiſhed his volume of Hymns, called "The Olney's Collection," it was enriched with ſome compoſitions from the pen of Cowper, diſtinguiſhed by the letter C. They bear internal evidence of a cultivated underſtanding, and an original genius. His time was now wholly dedicated to that literary leiſure, in which the mind, left to its own operations, follows up that line of purſuit which is the moſt congenial to its taſte, and the moſt adapted to its powers. In his garden, in his library, and in his daily walks, he ſeems to have diſciplined his muſe to the pictureſque and vivid habits of deſcription, which will always diſtinguiſh Cowper among our national poets. No writer, with the exception of Thomſon, ſeems to have ſtudied nature with more diligence, and to have copied her with more fidelity. An advantage which he has gained over other men, by his diſdaining to ſtudy her "through the ſpectacles of books," as Dryden calls it; and by his purſuing her through her haunts, and watching her in all her attitudes, with the eye of a philoſopher as well as of a poet. As Mr Cowper had no reliſh for public concerns, it was not ſingular that he ſhould have neglected the ſtudy of the law, on which he had entered. That knowledge of active life, which is ſo requiſite for the legal profeſſion, would hardly be acquired on the banks of the Ouſe, and in ſilent contemplations on the beauties of nature. In this retreat, he exchanged for the ſociety and converſe of the muſes, the ambition and tumult of a forenſic occupation; dedicating his mind to the cultivation of poetry, and ſtoring it with thoſe images which he derived from the inexhauſtible treaſury of a rich and varied ſcenery, in a moſt beautiful and romantic country.—The firſt volume of his poems, which was publiſhed by Mr Newton in 1787, conſiſts of various pieces, on various ſubjects. It ſeems, that he had been aſſiduous in cultivating a turn for grave and argumentative verſification, on moral and ethical topics. Of this kind is The Table Talk, and ſeveral other pieces in the collection. He who objects to theſe poems as containing too great a neglect of harmony in the arrangement of his words, and uſe of expreſſions too proſaic, will condemn him on principles of criticiſm which are by no means juſt, if the object and ſtyle of the ſubject be conſidered. Horace apologized for the ſtyle of his own ſatires, which are, ſtrictly ſpeaking, only ethical and moral diſcourſes, by obſerving, that thoſe topics required the *pedeſtrian* and familiar diction, and a form of expreſſion, nor carried to the heights of poetry. But if the reader will forego the delight of ſmooth verſification, and recollect that poetry does not altogether conſiſt in even and poliſhed metre, he will remark in theſe productions, no ordinary depth of thinking and of judgment, upon the moſt important objects of human intercourſe; and he will be occaſionally ſtruck with lines, not unworthy of Dryden for their ſtrength and dignity. His lighter poems are well known. Of theſe, the verſes ſuppoſed to be written by Alex. Selkirk, on the iſland of Juan Fernandez, are in the moſt popular eſtimation. There is great originality in the following ſtanza.

> I am out of humanity's reach;
> I muſt finiſh my journey alone;
> Never hear the ſweet muſic of ſpeech;
> I ſtart at the ſound of my own."

It would be abſurd to give one general character of the pieces that were publiſhed in this volume: yet, this is true concerning Mr Cowper's productions; that in all the varieties of his ſtyle, there may ſtill be diſcerned the likeneſs and impreſſion of the ſame mind; the ſame unaffected modeſty, which always rejects unſeaſonable ambitions and ornaments of language; the ſame eaſy vigour; the ſame ſerene and cheerful hope, derived from a ſteady and unſhaken faith in the dogmas of Chriſtianity. Mr Cowper, perhaps, does not derive praiſe from the choice and elegance of his words; but he has the higher praiſe of having choſen them without affectation. He appears to have uſed them as he found them; neither introducing faſtidious refinements nor adhering to obſolete barbariſms. He underſtood the whole ſcience of numbers, and he has practiſed their different kinds with conſiderable happineſs; and, if his verſes do not flow ſo ſoftly as the delicacy of a modern ear requires, that roughneſs, which is objected to in his poetry, is his choice, not his defect. But this ſort of critics, who admire only what is exquiſitely poliſhed, like Cuyp's pictures, theſe lovers of "gentleneſs without ſinews*," ought to take into their eſtimate, that vaſt effuſion of thought which is ſo abundantly poured over the writings of Cowper, without which human diſcourſe is only an idle combination of ſounds and ſyllables. The favourable reception which this volume experienced, produced another of ſuperior merit. His principal performance was undoubtedly "The Taſk," a poem. The occaſion that gave birth to it was trivial. A lady had requeſted him to write a piece in blank verſe, and gave him for its ſubject a thing next to her, viz. *the ſofa*. This he expanded into one of the fineſt moral poems our language has produced. It is written in blank verſe as deſired; and though in that reſpect it reſembles Milton's, it is nevertheleſs original and highly characteriſtic. It is not too ſtately for familiar deſcription, or too depreſſed for ſublime and elevated imagery. If it has any fault, it is that of being too much laden with idiomatic expreſſion; a fault which the author, in the rapidity with which his ideas and his utterance ſeem to have flowed, very naturally incurred. In this poem, his fancy ran with the moſt excurſive freedom. The poet enlarges upon his topics, and confirms his argument by every variety of illuſtration. He never however dwells upon them too long, and leaves off in ſuch a manner, that it ſeems it was in his power to have ſaid more. The arguments of the poem are various. The works of nature, the aſſociations with which they exhibit themſelves, the deſigns of Providence, and the paſſions of men. Of one advantage, the writer has amply availed himſelf. The work not being rigidly confined to any preciſe ſubject, he has indulged himſelf in all the laxity and freedom of a miſcellaneous poem. Yet he has ſtill adhered ſo faithfully to the general laws of congruity, that whether he inſpires the ſofter affections into his reader, or delights him with keen and playful raillery, or diſcourſes on the ordinary manners of human nature, or holds up the bright pictures of religious conſolation to his mind, he adopts, at pleaſure, a diction juſt and appropriate, equal in elevation to the ſacred effuſions of pious rapture, and ſufficiently eaſy and familiar for deſcriptions of domeſtic life; ſkilful alike in ſoaring without effort, and deſcending without meanneſs. He who deſires to put into the hands of youth a poem, which not deſtitute of poetic embelliſhment, is free from all matter of a licentious tendency, will find in the Taſk a book adapted to his purpoſe. It would be abſurd and extravagant auſterity to condemn thoſe poetical productions in which love conſtitutes the leading feature. That paſſion has in every age been the concernment of life, the theme of the poet, the plot of the ſtage. Yet there is a kind of amorous ſenſibility, bordering on morbid enthuſiaſm, which the youthful mind too often imbibes from the glowing ſentiments of the poets. Their genius deſcribes, in the moſt ſplendid colours, the operations of a paſſion which requires rebuke rather than incentive, and lends to the moſt grovelling ſenſuality the enchantments of a rich and creative imagination. But in the Taſk of Cowper, there is no licentiouſneſs of deſcription. All is grave, majeſtic, and moral. A vein of ſober thinking pervades every page, and, in finiſhed poetry, deſcribes the inſufficiency and vanity of human purſuits. Not that he is always ſevere. He frequently enlivens the mind of his reader by ſportive deſcriptions, and by repreſenting in elevated meaſures, ludicrous objects and circumſtances, a ſpecies of the mock heroic, ſo admired in Phillip's *Splendid Shilling*. The hiſtorical account he has given of chairs, in the firſt book of the Taſk, is a ſtriking ſpecimen of his powers of verſification, and of his talent for humour in this latter ſtyle. The attention is however the moſt detained by thoſe paſſages, in which the charms of rural life, and the endearments of domeſtic retirement are deſcribed. The Taſk abounds with incidents, introduced as epiſodes, and interpoſing an agreeable relief to the grave and ſerious part of the poetry. His

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*Dr Spratt's Life of Cowley.

Crazy Kate is a deſcription of the calamity of a diſordered reaſon, admirably exact and affecting.

> “ She begs an idle pin of all ſhe meets.”

What poet would have introduced ſo minute a circumſtance into his repreſentation ! and yet that minuteneſs conſtitutes its happy effect.

Of his talent for painting there cannot be a better ſpecimen than his ſketch of the melancholy man, probably ſketched from what too faithful remembrance ſuggeſted of himſelf :

> Look where he comes—In this embower'd alcove
> Stand cloſe concealed, and ſee a ſtatue move ;
> Lips buſy, and eyes fixt, foot falling ſlow,
> Arms hanging idly down, hands claſp'd below,
> Interpret to the marking eye, diſtreſs,
> Such as its ſymptoms only can expreſs.
> That tongue is ſilent now ;—that ſilent tongue
> Could argue once, could jeſt or join the ſong,
> Could give advice, could cenſure or commend,
> Or charm the ſorrows of a drooping friend.
> Renounc'd alike its office and its ſport,
> Its briſker and its graver ſtrains fall ſhort ;
> Both fall beneath a fever's ſecret ſway,
> And like a ſummer brook are paſt away.
>
> *Retirement.*

His John Gilpin is univerſally known, and may be conſidered as a ſportive piece of humour, which would have done credit to many writers, but can hardly be ſaid to have added to Mr Cowper's reputation. His next work was a tranſlation of the Iliad and Odyſſey into Miltonic blank verſe. It is an unjuſt piece of criticiſm to compare the verſion of Mr Pope to that of Mr Cowper. The merits of each are diſtinct and appropriate. Mr Pope has exhibited Homer as he would have ſung had he been born in England. Mr Cowper has endeavoured to pourtray him as he wrote in Greece, adhering frequently to the peculiarities of his original's idiom, and deſiring to preſerve his ſtrength and energy, together with his harmony and ſmoothneſs. Mr Cowper died of a ſevere and lingering illneſs, at Eaſt Dereham, in Norfolk, April 25. 1800.

COX, RICHARD, a learned prelate, and principal pillar of the Reformation, was born at Whaddon in Buckinghamſhire, of low parentage, in the year 1499. From Eton ſchool he obtained a ſcholarſhip in King's college in Cambridge, of which he became a fellow in 1519 : he was thence invited to Oxford by Cardinal Wolſey, and was there made one of the junior canons of Cardinal college. In 1525 he was incorporated bachelor ; and the following year took the degree of maſter of arts in the ſame univerſity. In this ſituation he became remarkable for his learning and poetical abilities ; but his attachment to the opinions of Luther rendered him hateful to his ſuperiors, who ſtripped him of his preferment, and threw him into priſon on a ſuſpicion of hereſy. Being, however, ſoon releaſed, he was choſen maſter of Eton ſchool, which flouriſhed remarkably under his care. In 1537 he commenced doctor of divinity at Cambridge ; in 1540 was made archdeacon of Ely ; and the following year prebendary of that cathedral, on its being new founded by King Henry VIII. In 1546 he was made dean of Chriſt-church, Oxford. By the recommendation of Archbiſhop Cranmer and Biſhop Goodrich, to the latter of whom he had been chaplain, he not only obtained the above preferments, but was choſen preceptor to Prince Edward, on whoſe acceſſion to the throne he became a favourite at court, was ſworn of the privy council, and made king's almoner. In 1547 he was elected chancellor of Oxford ; in 1548 canon of Windſor ; and the next year dean of Weſtminſter. About this time he was appointed one of the commiſſioners to viſit the univerſity of Oxford ; in which office his zeal for reformation was ſo exceſſive, that he deſtroyed a number of curious and valuable books, for no better reaſon than becauſe they were written by Roman Catholics. On the acceſſion of Queen Mary he was ſtripped of all his preferments and commited to the Marſhalſea. He was, however, ſoon releaſed, and immediately left the kingdom. Having reſided ſome time at Straſburg with his intimate friend Peter Martyr, on the death of Queen Mary he returned to England, and, with other divines, was appointed to reviſe the liturgy. He often preached before the queen ; and in 1559 was preferred to the ſee of Ely, which he continued to enjoy upwards of 21 years. He was, however, no favourite with the queen : the reaſon aſſigned for which was, his zealous oppoſition to her retaining the crucifix and wax-candles on the altar of the royal chapel ; alſo his ſtrenuous defence of the marriage of the clergy, which her majeſty always diſapproved. He died on the 22d of July 1581, aged 81. He was a man of conſiderable learning, a zealous and rigid bulwark of the church of England, and an implacable enemy both to Papiſts and Puritans. In a letter to Archbiſhop Parker, he adviſes him to proceed vigorouſly in reclaiming or *puniſhing* the Puritans, and not to be diſcouraged at the frown of thoſe court-favourites who protected them; aſſuring him that he might expect the bleſſing of God on his *pious* labours to free the church from their dangerous attempts, and to eſtabliſh uniformity. This zealous reformer we find had not totally loſt ſight of the Popiſh text, *compel them to come in ;* but a ſtronger proof of his implacability and ſelf-importance appears in his letter to the lord treaſurer Burleigh, in which he warmly expoſtulates with the council for interpoſing in behalf of the Puritans, or meddling in affairs of the church, admoniſhing them to keep their own ſphere. Such language from a biſhop would make a modern privy council ſtare. His works are, 1. Two Latin Orations on the Diſpute between Dr Treſham and Peter Martyr, Lond. 1549, 4to. 2. Liturgy of the Church of England ; in compiling, and afterwards correcting which, he was principally concerned. 3. The Lord's Prayer in verſe, commonly printed at the end of David's Pſalms by Sternhold and Hopkins. 4. Tranſlation of the four Goſpels, the Acts of the Apoſtles, and the Epiſtle to the Romans, in the new tranſlation of the Bible in the reign of Queen Elizabeth. 5. Reſolutions of ſome Queſtions concerning the Sacrament in the Collection of Records at the end of Burnet's Hiſtory of the Reformation. 6. Several Letters to the Queen and others, publiſhed in Strype's Annals of the Reformation. He is alſo ſaid to have been concerned in the declaration concerning the divine inſtitution of biſhops, and to have aſſiſted Lilye in his Grammar.

COXWOLD, a town in the north riding of Yorkſhire,

ſhire, 14 miles north of York. W. Long. 1. 10. N. Lat. 54. 16.

COYPEL, Anthony, an excellent French painter, born at Paris in 1661. Noyel Coypel, his father, being choſen by M. Colbert to be director of the academy at Rome, he took his ſon with him into Italy, where Anthony Coypel formed himſelf on the works of the greateſt maſters, and on his return to France was made firſt painter to the duke of Orleans. That prince employed him in painting the grand gallery of the royal palace, and allowed him a penſion. In 1714, he was director of the Academy of Painting and Sculpture. In 1715, he was made the firſt painter to the French king, and was ennobled on account of his merit He died in 1722. M. Coypel, his ſon, alſo excelled in the ſame art.

COZENING; tricking, or defrauding.—In law, it denotes an offence where any thing is done deceitfully, whether belonging to contracts or not, which cannot be properly termed by any ſpecial name.

COZUMEL, an iſland near the weſtern coaſt of Jucatan, where Cortez landed and refreſhed his troops before entering upon the conqueſt of Mexico. W. Long. 89. 0. and N. Lat. 13. 0.

CRAB. See Cancer, Entomology *Index*.

Crab's *Claws*, in the *Materia Medica*, are the tips of the claws of the common crab broken off at the verge of the black part, ſo much of the extremity of the claws only being allowed to be uſed in medicine as is tinged with this colour. The blackneſs, however, is only ſuperficial; they are of a grayiſh white within, and when levigated furniſh a white powder.

Crab's claws are of the number of the alkaline abſorbents; but they are ſuperior to the generality of them, in ſome degree, as they are found on a chemical analyſis to contain a volatile urinous ſalt.

Crab's *Eyes*, in *Pharmacy*, are a ſtrong concretion in the head of the cray-fiſh. They are rounded on one ſide, and depreſſed and ſinuated on the other, conſiderably heavy, moderately hard, and without ſmell. We have them from Holland, Muſcovy, Poland, Denmark, Sweden, and many other places. What are uſually met with in the ſhops are prepared by art.

Crab's eyes are much uſed both in the ſhop medicines and extemporaneous preſcription, being accounted abſorbent.

Crab-*Lice*, a troubleſome kind of vermin, which ſtick ſo faſt with their claws to the ſkin as to render it difficult to diſlodge them. They are called *plactulæ*, *morpiones*, *petolæ*, and *peſſolatæ*: they uſually infeſt the arm-pits and *pudenda*. Cleanlineſs is the beſt preventive. But theſe vermin may be eaſily removed with the application of a little mercurial ointment.

Crab, a ſort of wooden pillar, whoſe lower end, being let down through a ſhip's decks, reſt upon a ſocket like the capſtern; and having in its upper end three or four holes, at different heights, through the middle of it, one above another, into which long bars are thruſt, whoſe length is nearly equal to the breadth of the neck. It is employed to wind in the cable, or to purchaſe any other weighty body which requires a great mechanical power. This differs from a capſtern, as not being furniſhed with a *drum-head*, and by having the bars to go entirely through it, reaching from one ſide of the deck to the other; whereas thoſe of the capſtern, which are ſuperior in number, reach only about eight inches or a foot into the drum-head, according to its ſize. See Capstern.

Crab-Yaws, a name in Jamaica for a kind of ulcer on the ſoles of the feet, with hard callous lips, ſo hard that it is difficult to cut them. The *ungt. cærul. fort.* is their cure.

CRACATOA, the moſt ſoutherly of a cluſter of iſlands lying in the entrance of the ſtraits of Sunda in the Eaſt Indies. Its whole circumference does not exceed nine miles; and off its north-eaſtern extremity is a ſmall iſland forming a road, in which Captain Cook anchored when viſiting this iſland on his laſt voyage. On the ſouthern part of the ſmall iſland is a reef of rocks, within which is a tolerable ſhelter againſt all northerly winds, there being 27 fathoms water in the mid channel, and 18 near the reef. Between the two iſlands there is a narrow paſſage for boats. The ſhore that conſtitutes the weſt ſide of the road runs in a north-weſterly direction, having a bank of coral running into the ſea for a little way, ſo that it is difficult for boats to land except at the time of high water; but the anchoring ground is very good and free from rocks. In the inland parts the ground is elevated, riſing on all ſides gradually from the ſea, and is entirely covered with wood, excepting a few ſpots which are cleared by the inhabitants for ſowing rice. The climate is reckoned very healthy in compariſon with the neighbouring countries, but it is very thinly inhabited. There are abundance of turtle on the coral reefs; but other refreſhments are ſcarce, and ſold at an exorbitant price. Water is not plentiful: Captain Cook was obliged to ſupply himſelf from a ſmall ſpring oppoſite to the ſouthern extremity of the ſmall iſland above mentioned. To the ſouthward is a hot ſpring, whoſe waters are uſed as a bath by the inhabitants. The road where the Reſolution anchored lies in S. Lat. 8. 6. and by obſervation, in 105. 36. E. Long. by the time-keeper in 104. 48. The variation of the compaſs one degree W. On the full and change days it is high water at ſeven o'clock in the morning, and the tide riſes three feet four inches perpendicular.

CRACKOW, or Cracow, a city of Poland, ſituated in a palatinate of the ſame name, E. Long. 20. 16. N. Lat. 50. 8. It was formerly the capital of Poland, where the kings were elected and crowned, and was once almoſt the centre of the Poliſh dominions, but is now a frontier town; a proof how much the power of this republic has been contracted.

Crackow ſtands in an extenſive plain, watered by the Viſtula, which is broad but ſhallow: the city and its ſuburbs occupy a vaſt tract of ground, but are ſo badly peopled, that they ſcarcely contain 16,000 inhabitants. The great ſquare in the middle of the town is very ſpacious, and has ſeveral well-built houſes, once richly furniſhed and well inhabited, but moſt of them now either untenanted or in a ſtate of melancholy decay. Many of the ſtreets are broad and handſome; but almoſt every building bears the moſt ſtriking marks of ruined grandeur: the churches alone ſeem to have preſerved their original ſplendour. The devaſtation of this unfortunate town was begun by the Swedes at the commencement of the preſent century, when it was beſieged and taken by Charles XII. but the miſchiefs it ſuffered from that ravager of the north were far leſs deſtructive than thoſe it experienced during the late dreadful commotions, when it underwent repeated ſieges, and was alternately in poſſeſſion of the Ruſſians and Confederates. The effects of cannon, grape, and muſket ſhot, are ſtill diſcernible on the walls and houſes. In a word, Crackow exhibits the remains of ancient magnificence, and looks like a great capital in ruins: from the number of fallen and falling houſes one would imagine it had lately been ſacked, and that the enemy had left it only yeſterday. The town is ſurrounded with high walls of brick, ſtrengthened by round and ſquare towers of whimſical ſhapes, in the ancient ſtyle of fortification: theſe walls were built by Venceſlaus king of Bohemia during the ſhort period in which he reigned over Poland.

The univerſity of Crackow was formerly, and not unjuſtly, called the mother of Poliſh literature, as it principally ſupplied the other ſeminaries with profeſſors and men of learning; but its luſtre has been greatly obſcured by the removal of the royal reſidence to Warſaw, and ſtill more by the late inteſtine convulſions. In this city the art of printing was firſt introduced into Poland by Haller; and one of the earlieſt books was the Conſtitutions and Statutes compiled by Caſimir the Great, and afterwards augmented by his ſucceſſors. The characters are Gothic, the ſame which were univerſally uſed at the invention of printing: the great initial letters are wanting, which ſhows that they were probably painted and afterwards worn away. The year in which this compilation was printed is not poſitively known; but its publication was certainly anterior to 1496, as it does not contain the ſtatutes paſſed by John Albert in that year. The moſt flouriſhing period of the univerſity was under Sigiſmond Auguſtus in the 16th century, when ſeveral of the German reformers fled from the perſecutions of the emperor Charles V. and found an aſylum in this city. They gave to the world ſeveral verſions of the ſacred writings, and other theological publications, which diffuſed the reformed religion over great part of Poland. The protection which Sigiſmond Auguſtus afforded to men of learning of all denominations, and the univerſal toleration which he extended to every ſect of Chriſtians, created a ſuſpicion that he was ſecretly inclined to the new church; and it was even reported that he intended to renounce the Catholic faith, and publicly profeſs the reformed religion.

Towards the ſouthern part of the town, near the Viſtula, riſes a ſmall eminence or rock, upon the top of which is built the palace, ſurrounded with brick walls and old towers, which form a kind of citadel to the town. This palace owes its origin to Ladiſlaus Jaghellon; but little of the ancient ſtructure now appears, as the greateſt part was demoliſhed by Charles XII. in 1701, when he entered this town in triumph after the battle of Cliſſow. It has been ſince repaired. The remains of the old palace conſiſt of a few apartments, which are left in their ancient ſtate as they exiſted in the laſt century. This palace was formerly the reſidence of the kings of Poland, who, from the time of Ladiſlaus Locketec, have been crowned at Crackow. The Poliſh and German hiſtorians differ concerning the time when the title of king was firſt claimed by the ſovereigns of this country; but the moſt probable account is, according to Mr Coxe, that in 1295 Premiſlaus aſſumed the regal title, and was inaugurated at Gneſna by the archbiſhop of that dioceſe. He was ſucceeded by Ladiſlaus Locketec, who offending the Poles by his capricious and tyrannical conduct, was depoſed before he was crowned; and Venceſlaus king of Bohemia, who had married Richſa daughter of Premiſlaus, being elected in his ſtead, was in 1300 conſecrated at Gneſna. Ladiſlaus, after flying from his country and undergoing a ſeries of calamitous adventures, was at length brought to a ſenſe of his miſconduct. Having regained the affection of his ſubjects, he was reſtored, in the lifetime of Venceſlaus, to part of his dominions; and he recovered them all upon the demiſe of that monarch in the year 1305: he governed, however, for ſome years without the title of king; but at length in 1320 was crowned at Crackow, to which place he transferred the ceremony of the coronation; and afterwards enacted, that for the future his ſucceſſors ſhould be inaugurated in the cathedral of this city.

Since that period all the ſovereigns have been conſecrated at Crackow, excepting the laſt king. Previous to his election a decree was iſſued by the diet of convocation, that the coronation ſhould be ſolemnized for this turn at Warſaw, without prejudice in future to the ancient right of Crackow; a proviſo calculated to ſatiſfy the populace, but which will not probably prevent any future ſovereign from being crowned at Warſaw, now become the capital of Poland and the reſidence of its kings. The diadem and other regalia uſed at the coronation are ſtill kept in the palace of Crackow, under ſo many keys, and with ſuch care, that it is impoſſible to obtain a ſight of them.

Adjoining to the palace ſtands the cathedral, alſo within the walls of the citadel. Here all the ſovereigns, from the time of Ladiſlaus Locketec, have been interred, a few only excepted, viz. Louis and Ladiſlaus II. who were kings of Hungary as well as of Poland, and whoſe bodies were depoſited in Hungary; Alexander, who died and was buried at Vilna; Henry of Valois, interred in France; and the late monarch Auguſtus III. The ſepulchres of the kings of Poland are not diſtinguiſhed by any peculiar magnificence; their figures are carved in marble of no extraordinary workmanſhip, and ſome are without inſcriptions.

The biſhop of Crackow is the firſt in the kingdom, duke of Saveria, and very often a cardinal. His revenues are larger than thoſe of his metropolitan the archbiſhop of Gneſna, and are computed to amount to 40,000 dollars per annum.

CRADLE, a well known machine in which infants are rocked to ſleep.

It denotes alſo that part of the ſtock of a croſs bow where the bullet is put.

CRADLE, in *Surgery*, a caſe in which a broken leg is laid after being ſet.

CRADLE, in engraving, is the name of an inſtrument uſed in ſcraping mezzotintos, and preparing the plate. It is formed of ſteel, reſembling a chiſſel with one ſloping ſide, upon which are cut hollow lines very near each other, and at equal diſtances. The acting part of this tool is made circular, and the corners are rounded. After being properly tempered, it muſt be ſharpened on the whetſtone. There are various ſizes of this inſtrument.

Cradle, among ſhipwrights, a frame placed under the bottom of a ſhip, in order to conduct her ſmoothly and ſteadily into the water when ſhe is going to be launched; at which time it ſupports her weight while ſhe ſlides down the deſcent or ſloping paſſage called *the ways*, which are for this purpoſe daubed with ſoap and tallow.

CRAFT, a general name for all ſorts of veſſels employed to load or diſcharge merchant ſhips, or to carry alongſide or return the ſtores of men of war. Such are lighters, hoys, barges, prames, &c. See thoſe articles.

CRAKE, or Corn-crake. See Rallus, Ornithology *Index*.

CRAIL, or Careil, a parliament town of Scotland, ſituated on the ſea-coaſt of the county of Fife, about ſeven miles ſouth-eaſt of St Andrews. W. Long. 2. 20. N. Lat. 56. 17.

CRAMBE, Sea-cabbage, Sea-beach Kale, or Sea-colewort, a genus of plants belonging to the tetradynamia claſs, and in the natural method ranking under the 39th order, *Siliquoſæ*. See Botany *Index*.

CRAMERIA, a genus of plants belonging to the tetrandria claſs. See Botany *Index*.

CRAMOND, Over and Nether, two villages about four miles weſt of Edinburgh; of which only the laſt deſerves notice, as having been once a famous naval ſtation of the Romans. It is ſituated at the influx of the river Almond into the Forth. Three Roman roads meet at this place, which was called by them *Alaterva*, and whither they brought their grain for the ſupport of their troops. The village contains about 300 inhabitants. Here are the remains of a bath and ſudatory; and many altars, medals, &c. have been dug up.

CRAMP, a ſpaſmodic affection of the muſcles of different parts of the body, as of thoſe of the neck, arms, legs, &c. accompanied with a violent but tranſitory pain. See Medicine *Index*.

Cramp-Fiſh, or *Torpedo*. See Raja, Ichthyology *Index*.

Cramp-Iron, or *Cramps*, a piece of iron bent at each end, which ſerves to faſten together pieces of wood, ſtones, or other things.

CRAMPONEE, in *Heraldry*, an epithet given to a croſs which has at each end a cramp or ſquare piece coming from it; that from the arm in chief towards the ſiniſter angle, that from the arm on that ſide downwards, that from the arm in baſe towards the dexter ſide, and that from the dexter arm upwards.

CRANAGE, the liberty of uſing a crane at a wharf, and alſo the money paid for drawing up wares out of a ſhip, &c. with a crane.

CRANE. See Ardea, Ornithology *Index*.

Crane, in *Mechanics*, a machine uſed in building for raiſing large ſtones and other weights. See Mechanics.

Crane's Bill. See Geranium, Botany *Index*.

Crane-Fly, a ſpecies of Tipula. See Entomology *Index*.

CRANGANOR, a Dutch factory on the Malabar coaſt in the Eaſt Indies, ſeated in E. Long. 75. 5. N. Lat. 10. 0. See Cochin.

CRANIOLARIA, a genus of plants belonging to the didynamia claſs; and in the natural method ranking under the 40th order, *Perſonatæ*.

CRANIUM, in *Anatomy*, an aſſemblage of ſeveral bones which cover and encloſe the brain and cerebellum, popularly called the *ſkull*. See Anatomy *Index*.—The word comes from the Greek κρανιον, of κρανος, *galea*, "helmet;" becauſe it ſerves to defend the brain like a head-piece. Pezron, again, derives κρανιον, from the Celtic *cren*, becauſe of its roundneſs.

CRANK, a contrivance in machines, in manner of an elbow, only of a ſquare form, projecting out from an axis or ſpindle; and ſerving, by its rotation, to raiſe and fall the piſtons of engines for raiſing water or the like.

Crank, in ſea-language. A ſhip is ſaid to be *crank-ſided*, when for want of a ſufficient quantity of ballaſt or cargo, ſhe cannot bear her ſails, or can bear but ſmall ſail for fear of overſetting.—She is ſaid to be *crank by the ground*, when her floor is ſo narrow that ſhe cannot be brought on ground without danger.

Crank is alſo an iron brace which ſupports the lanthorns on the poop-quarters, &c.

CRANMER, Thomas, a celebrated archbiſhop, reformer, and martyr, was the ſon of Thomas Cranmer, Eſq. of Aſlacton in Nottinghamſhire, where our author was born in 1489. At the age of 14, he was admitted a ſtudent of Jeſus College, Cambridge, of which he afterwards became fellow; but marrying the relation of an innkeeper's wife, he loſt his fellowſhip and quitted the college. On the death of his wife he was re-admitted fellow of Jeſus College. In 1523 he took the degree of doctor of divinity, and was made theological lecturer and examiner. The plague being at Cambridge, he retired to the houſe of a relation at Waltham Abbey, where, meeting with Fox the king's almoner, and Gardiner the ſecretary, he gave his opinion concerning King Henry's marriage with Catharine much to the ſatisfaction of his majeſty. This opinion was, that inſtead of diſputing about the validity of the king's marriage with Catharine, they ſhould reduce the matter to this ſimple queſtion, "Whether a man may marry his brother's wife or not?" When the king was told of it, he ſaid, "This fellow has got the right ſow by the ear." He then ſent for him to court, made him one of his chaplains, and ordered him to write in vindication of the divorce in agitation. This book having quieted the tender conſcience of the king, he was deſirous that all Europe ſhould be convinced of the illegality of his marriage with Queen Catharine; and for that purpoſe ſent Cranmer to France, Italy, and Germany, to diſpute the matter with the divines of thoſe countries. At Nuremberg Cranmer married a ſecond wife. Being returned to England, in March 1533 he was conſecrated archbiſhop of Canterbury; in May following he pronounced the ſentence of divorce between the king and queen; and ſoon after married the amorous monarch to Ann Boleyn. Being now at the head of the church, he exerted himſelf in the buſineſs of the Reformation. The Bible was tranſlated into Engliſh, and monaſteries diſſolved, principally by his means.

In 1536 the royal conſcience again required the aſſiſtance of our archbiſhop: in this year he divorced the king from Ann Boleyn. In 1537 he viſited his dioceſe, and endeavoured to aboliſh the ſuperſtitious obſervance of holidays. In 1539 he and ſome of the biſhops fell under the king's diſpleaſure, becauſe they could not be brought to give their conſent in parliament that the monaſteries ſhould be ſuppreſſed for the king's ſole uſe. He alſo ſtrenuouſly oppoſed the act for the ſix articles in the houſe of lords, ſpeaking three days againſt it; and upon the paſſing of that ſtatute ſent away his wife into Germany. In 1540 he was one of the commiſſioners for inſpecting into matters of religion and explaining ſome of its chief doctrines. The reſult of their commiſſion was the book entitled A neceſſary Erudition of any Chriſtian man. After Lord Cromwell's death (in whoſe behalf he had written to the king), he retired and lived in great privacy, meddling not at all with ſtate affairs. In 1541 he gave orders, purſuant to the king's directions, for taking away ſuperſtitious ſhrines; and exchanging Biſhopſbourn for Beckeſbourn, united the latter to his dioceſe. In 1542 he procured the "Act for the advancement of true religion and the aboliſhment of the contrary," which moderated the rigour of the ſix articles. But the year following, ſome enemies preferring accuſations againſt him, he had like to have been ruined, had not the king interpoſed in his behalf. His majeſty continued afterwards to protect him from his enemies; and at his death appointed him one of the executors of his will, and one of the regents of the kingdom. In 1556 he crowned young Edward, during whoſe ſhort reign he promoted the reformation to the utmoſt of his power; and was particularly inſtrumental in compoſing, correcting, and eſtabliſhing the liturgy by act of parliament. He had alſo a ſhare in compiling the thirty-nine articles of religion.

In 1553 he oppoſed the new ſettlement of the crown upon Lady Jane Gray, and would no way be concerned in that affair (though at laſt, through many importunities, he was prevailed upon to ſet his hand to it); neither would he join in any of Dudley's ambitious projects. Upon Queen Mary's acceſſion to the throne, he was committed to the Tower; partly for ſetting his hand to the inſtrument of Lady Jane's ſucceſſion, and partly for the public offer he had made a little before of juſtifying openly the religious proceedings of the late king. Some of his friends, foreſeeing the ſtorm that was likely to fall upon him, adviſed him to fly, but he abſolutely refuſed. In the enſuing parliament, on November the 3d, he was attainted, and at Guildhall found guilty of high treaſon; whereupon the fruits of his archbiſhopric were ſequeſtered. In April 1554, he and Ridley and Latimer were removed to Oxford, in order for a public diſputation with the Papiſts; which was accordingly held there towards the middle of the month, with great noiſe, triumph, and impudent confidence on the Papiſts ſide, and with as much gravity, learning, modeſty, and convincing ſufficiency on the ſide of the Proteſtant biſhops. The 20th of April, two days after the end of theſe diſputations, Cranmer and the two others were brought before the commiſſioners, and aſked, Whether they would ſubſcribe (to Popery)? which they unanimouſly refuſing, were condemned as heretics. From this ſentence the archbiſhop appealed to the juſt judgment of the Almighty; and wrote to the council, giving them an account of the diſputation, and deſiring the queen's pardon for his treaſon, which it ſeems was not yet remitted. By the convocation which met this year, his Defence of the true and Catholic Doctrine of the Sacrament of the Body and Blood of our Saviour Chriſt was ordered to be burnt. Some of his friends petitioned the queen in his behalf; putting her in mind how he had once preſerved her in her father's time by his earneſt interceſſions with him for her, ſo that ſhe had reaſon to believe he loved her, and would ſpeak the truth to her more than all the reſt of the clergy. All endeavours in his behalf, however, were ineffectual; and the archbiſhop being degraded and moſt ignominiouſly treated, was at laſt flattered and terrified into an inſincere recantation and renunciation of the Proteſtant faith. But this triumph was not ſufficient to gratify the pious vengeance of the Romiſh Mary. On the 24th of Feb. 1556, a writ was ſigned for the burning of Cranmer; and on the 24th March, which was the fatal day, he was brought to St Mary's church, Oxford, and placed on a kind of ſtage over againſt the pulpit, where Dr Cole, provoſt of Eton, was appointed to preach a ſermon on the occaſion. While Cole was haranguing, the unfortunate Cranmer expreſſed great inward confuſion; often lifting up his hands and eyes to heaven, and frequently pouring out floods of tears. At the end of the ſermon, when Cole deſired him to make an open profeſſion of his faith, as he had promiſed him he would, he firſt prayed in the moſt fervent manner; then made an exhortation to the people preſent, not to ſet their minds upon the world, to obey the king and queen, to love each other, and to be charitable. After this he made a confeſſion of his faith, beginning with the creed, and concluding with theſe words: "And I believe every word and ſentence taught by our Saviour Jeſus Chriſt, his apoſtles, and prophets, in the Old and New Teſtament.—And now (added he) I come to the great thing that ſo much troubleth my conſcience, more than any thing I ever did or ſaid in my whole life; and that is the ſetting abroad a writing contrary to the truth, which I here now renounce as things written with my hand contrary to the truth which I thought in my heart; and written for fear of death, and to ſave my life if it might be: that is, all ſuch bills and papers which I have written or ſigned with my hand ſince my degradation, wherein I have written many things untrue. And foraſmuch as my hand offended, writing contrary to my heart, my hand ſhall firſt be puniſhed; for, may I come to the fire, it ſhall be firſt burned. As for the pope, I refuſe him as Chriſt's enemy and antichriſt, with all his falſe doctrine. And as for the ſacrament, I believe as I have taught in my book againſt the biſhop of Wincheſter." Thunderſtruck as it were with this unexpected declaration, the enraged Popiſh crowd admoniſhed him not to diſſemble. "Ah! (replied he with tears) ſince I lived hitherto, I have been a hater of falſehood and a lover of ſimplicity, and never before this time have I diſſembled." Whereupon they pulled him off the ſtage with the utmoſt fury, and hurried him to the place of his martyrdom over againſt Baliol college; where he put off his clothes in haſte, and ſtanding in his ſhirt, and without ſhoes, was faſtened with a chain to the ſtake. Some preſſing him to agree to his former recantation, he anſwered, ſhowing his hand, “ This is the hand that wrote it, and therefore it ſhall firſt ſuffer puniſhment.” Fire being applied to him, he ſtretched out his right hand into the flame, and held it there unmoved (except that once with it he wiped his face) till it was conſumed ; crying with a loud voice, “ This hand hath offended ;” and often repeating, “ This unworthy right hand.” At laſt the fire getting up, he ſoon expired, never ſtirring or crying out all the while ; only keeping his eyes fixed to heaven, and repeating more than once, “ Lord Jeſus receive my ſpirit.” Such was the end of the renowned Thomas Cranmer, in the 67th year of his age.

It was noticed above, that after the paſſing of the act for the ſix articles, Archbiſhop Cranmer ſent his wife into Germany. But ſhe afterwards returned again to England ; and Mr Strype informs us that “ in the time of King Edward, when the marriage of the clergy was allowed, he brought her forth, and lived openly with her.” Mr Gilpin ſays, “ he left behind him a widow and children ; but as he always kept his family in obſcurity for prudential reaſons, we know little about them. They had been kindly provided for by Henry VIII. ; who, without any ſolicitation from the primate himſelf, gave him a conſiderable grant from the abbey of Walbeck in Nottinghamſhire, which his family enjoyed after his deceaſe. King Edward made ſome addition to his private fortune ; and his heirs were reſtored in blood by an act of parliament in the reign of Elizabeth.

Archbiſhop Cranmer wrote a great number of books : many of them he publiſhed himſelf ; and many of them ſtill remain in MSS. viz. two folio volumes in the king’s library, ſeveral letters in the Cotton collection, &c.

Mr Gilpin remarks, That “ the character of the archbiſhop hath been equally the ſubject of exaggerated praiſe and of undeſerved cenſure. The moſt indefenſible parts of the archbiſhop’s character are the readineſs with which he ſometimes concurred in the unjuſtifiable proceedings of Henry VIII. and the inſtances wherein he ſhowed himſelf to be actuated by intolerant principles.

“ He firſt recommended himſelf to Henry by the zeal which he diſplayed in promoting the king’s divorce from Queen Catharine. As to this, it may be allowed, that Dr Cranmer might think the marriage wrong : but though it poſſibly might be a point of conſcience with the king, it could, however, be none with him ; and there was manifeſtly a difference between adviſing not to do a thing, and adviſing to undo it when already done, at leaſt in a matter of ſo diſputable a nature. On the other hand, to repudiate a woman with whom the king had cohabited near 20 years as his wife, and to illegitimate a daughter, bred up in the higheſt expectations, and now marriageable, were acts of ſuch cruelty, that it ſeems to indicate a want of feeling to be in any degree acceſſary to them. To this may be added, that the notoriety of the king’s paſſion for Ann Boleyn, which all men believed to be, if not the firſt mover, at leaſt the principal ſpring of his pretended ſcruples, threw a very indelicate imputation on all who had any concern in the affair. No ſerious churchman, one would imagine, could be fond of the idea of adminiſtering to the king’s paſſions. It is with concern, therefore, that we ſee a man of Dr Cranmer’s integrity and ſimplicity of manners acting ſo much out of character as to compound an affair of this kind, if not with his conſcience, at leaſt with all delicacy of ſentiment ; and to parade through Europe, in the quality of an ambaſſador, defending everywhere the king’s *pious intentions*. But the cauſe (continues Mr Gilpin) animated him. With the illegality of the king’s marriage, he endeavoured virtually to eſtabliſh the inſufficiency of the pope’s diſpenſation ; and the latter was an argument ſo near his heart, that it ſeems to have added merit to the former. We cannot indeed account for his embarking ſo zealouſly in this buſineſs, without ſuppoſing his principal motive was to free his country from the tyranny of Rome, to which this ſtep very evidently led. So deſirable an end would in ſome degree, he might imagine, ſanctify the means.”

Of two of the inſtances of perſecution in which Archbiſhop Cranmer was concerned, Mr Gilpin gives the following account. “ Joan Bocher and George Paris were accuſed, though at different times ; one for denying the humanity of Chriſt, the other for denying his divinity. They were both tried and condemned to the ſtake ; and the archbiſhop not only conſented to theſe acts of blood, but even perſuaded the averſion of the young king into a compliance. “ Your majeſty muſt diſtinguiſh (ſaid he, informing his royal pupil’s conſcience) between common opinions and ſuch as are the eſſential articles of faith. Theſe latter we muſt on no account ſuffer to be oppoſed.” Mr Gilpin juſtly obſerves, that “ nothing even plauſible can be ſuggeſted in defence of the archbiſhop on this occaſion, except only that the ſpirit of Popery was not yet wholly repreſſed.” Theſe inſtances of injuſtice and barbarity were indeed totally indefenſible, and a great diſgrace to Cranmer and to all who were concerned in them. It does not appear that he endeavoured to promote the death of Lambert ; but, as Mr Gilpin obſerves, it were to be wiſhed he had rid his hand of the diſputation likewiſe. The public diſputation, in which Cranmer bore ſome part, proved the means of bringing Lambert to the ſtake.

One of the moſt honourable tranſactions of Archbiſhop Cranmer’s life, was the firm ſtand that he made againſt the act of the ſix articles. This act was ſo ſtrongly ſupported by the king, that even the Proteſtants in parliament made little oppoſition to it. But Cranmer oppoſed it with great zeal and ſteadineſs. “ The good archbiſhop (ſays Mr Gilpin) never appeared in a more truly Chriſtian light than on this occaſion. In the midſt of ſo general a defection (for there were numbers in the houſe who had hitherto ſhown great forwardneſs in reformation) he alone made a ſtand. Three days he maintained his ground, and baffled the arguments of all oppoſers. But argument was not their weapon, and the archbiſhop ſaw himſelf obliged to ſink under ſuperior power. Henry ordered him to leave the houſe. The primate refuſed : “ It was God’s buſineſs (he ſaid), and not man’s. And when he could do no more, he boldly entered his proteſt. Such an inſtance of fortitude is ſufficient to wipe off many of thoſe courtly ſtains which have faſtened on his memory.”

His behaviour in the cauſe of the duke of Norfolk was alſo entitled to great commendation. “ The laſt act of this reign (ſays Mr Gilpin) was an act of blood, and gave the archbiſhop a noble opportunity of ſhowing how well he had learned that great Chriſtian leſſon of forgiving an enemy. Almoſt without the ſhadow of juſtice, Henry had given directions to have the duke of Norfolk attainted by an act of parliament. The king's mandate ſtood in lieu of guilt, and the bill paſſed the houſe with great eaſe. No man, except the biſhop of Wincheſter, had been ſo great an enemy to the archbiſhop as the duke of Norfolk. He had always thwarted the pimate's meaſures, and oftener than once had practiſed againſt his life. How many would have ſeen with ſecret pleaſure the working of Providence againſt ſo rancorous an enemy; ſatisfied in having themſelves no hand in his unjuſt fate! But the archbiſhop ſaw the affair in another light: he ſaw it with horror; and although the king had in a particular manner intereſted himſelf in this buſineſs, the primate oppoſed the bill with all his might; and when his oppoſition was vain, he left the houſe with indignation, and retired to Croydon."

He was indeed remarkable for the placability of his temper, and for ſhowing kindneſs to thoſe by whom he had been greatly injured. Hence it is mentioned in Shakeſpeare's Henry VIII. as a common ſaying concerning him:

——————" Do my lord of Canterbury
But one ſhrewd turn, and he's your friend for ever."

Archbiſhop Cranmer was a great friend and patron of learned foreigners, who had been perſecuted for their attachment to the principles of the reformation. Mr Gilpin ſays, " the ſuffering profeſſors of Proteſtantiſm, who were ſcattered in great numbers about the various countries of Europe, were always ſure of an aſylum with him. His palace at Lambeth might be called a ſeminary of learned men; the greater part of whom perſecution had driven from home. Here, among other celebrated reformers, Martyr, Bucer, Aleſs, Phage, found ſanctuary. Martyr, Bucer, and Phage, were liberally penſioned by the archbiſhop till he could otherwiſe provide for them. It was his wiſh to fix them in the two univerſities, where he hoped their great knowledge and ſpirit of inquiry would forward his deſigns of reſtoring learning; and he at length obtained profeſſorſhips for them all. Bucer and Phage were ſettled at Cambridge; where they only ſhowed what might have been expected from them, both dying within a few months after their arrival. But at Oxford Martyr acted a very conſpicuous part, and contributed to introduce among the ſtudents there a very liberal mode of thinking.

Of the learning of Archbiſhop Cranmer, Mr Gilpin remarks, that " it was chiefly confined to his profeſſion. He had applied himſelf in Cambridge to the ſtudy of the Greek and Hebrew languages; which though eſteemed at that time as the mark of hereſy, appeared to him the only ſources of attaining a critical knowledge of the Scriptures. He had ſo accurately ſtudied canon law, that he was eſteemed the beſt canoniſt in England; and his reading in theology was ſo extenſive, and his collections from the Fathers ſo very voluminous, that there were few points in which he was not accurately informed, and in which he could not give the opinions of the ſeveral ages of the church from the times of the apoſtles. He was a ſenſible writer, rather nervous than elegant. His writings were entirely confined to the great controverſy which then ſubſiſted, and contain the whole ſum of the theological learning of thoſe times. His library was filled with a very noble collection of books, and was open to all men of letters.

Mr Gilpin, after remarking that Archbiſhop Cranmer preached often wherever he viſited, ſays, " In his ſermons to the people he was very plain and inſtructive; inſiſting chiefly on the eſſentials of Chriſtianity. The ſubjects of his ſermons, for the moſt part, were from whence ſalvation is to be fetched, and on whom the confidence of man ought to lean. They inſiſted much on doctrines of faith and works; and taught what the fruits of faith were, and what place was to be given to works; they inſtructed men in the duties they owed their neighbour, and that every one was our neighbour, to whom we might any way do good; they declared what men ought to think of themſelves after they had done all; and, laſtly, what promiſes Chriſt hath made, and who they are to whom he will make them good. Thus he brought in the true preaching of the goſpel, altogether different from the ordinary way of preaching in thoſe days; which was to treat concerning ſaints, to tell legendary tales of them, and to report miracles wrought for the confirmation of tranſubſtantiation and other popiſh corruptions. And ſuch a heat of conviction accompanied his ſermons, that the people departed from them with minds poſſeſſed of a great hatred of vice, and burning with a deſire of virtue."

He was a great economiſt of his time. Mr Gilpin ſays, " he roſe commonly at five o'clock and continued in his ſtudy till nine. Theſe early hours, he would ſay, were the only hours he could call his own. After breakfaſt he generally ſpent the remainder of the morning either in public or private buſineſs. His chapel-hour was eleven, and his dinner-hour twelve. After dinner he ſpent an hour either in converſation with his friends, in playing at cheſs, or in, what he liked better, overlooking a cheſs-board. He then retired again to his ſtudy till his chapel-bell rang at five. After prayers, he generally walked till ſix, which was in thoſe times the hour of ſupper. His evening meal was ſparing. Often he ate nothing; and when that was the caſe, it was his uſual cuſtom, as he ſat down to table, to draw on a pair of gloves: which was as much as to ſay, that his hands had nothing to do. After ſupper, he ſpent an hour in walking and another in his ſtudy, retiring to his bedchamber about nine. This was his uſual mode of living when he was moſt vacant, but very often his afternoons as well as his mornings were engaged in buſineſs. He generally, however, contrived, if poſſible, even in the buſieſt day, to devote ſome portion of his time to his books beſides the morning. And Mr Fox tells us, he always accuſtomed himſelf to read and write in a ſtanding poſture; eſteeming conſtant ſitting very pernicious to a ſtudious man."

Mr Gilpin alſo obſerves, " that he was a very amiable maſter in his family, and admirably preſerved the difficult medium between indulgence and reſtraint. He had, according to the cuſtom of the times, a very numerous retinue, among whom the moſt exact order was obſerved. Every week the ſteward of his houſehold held a kind of court in the great hall of his palace; in which all family affairs were ſettled, ſervants wages were paid, complaints were heard, and faults examined. Delinquents were publicly rebuked, and after the third admonition diſcharged. His hoſpitality and charities were great and noble; equal to his ſtation, greater often than his abilities. A plentiful table was among the virtues of thoſe days. His was always bountifully covered. In an upper room was ſpread his own, where he ſeldom wanted company of the firſt diſtinction. Here a great many learned foreigners were daily entertained, and partook of his bounty. In his great hall a long table was plentifully covered every day for gueſts and ſtrangers of a lower rank: at the upper end of which were three ſmaller tables, deſigned for his own officers and inferior gentlemen. Among other inſtances of the archbiſhop's charity, we have one recorded which was truly noble. After the deſtruction of monaſteries, and before hoſpitals were erected, the nation ſaw no ſpecies of greater miſery than that of wounded and diſbanded ſoldiers. For the uſe of ſuch miſerable objects as were landed on the ſouthern coaſts of the iſland, the archbiſhop fitted up his manor-houſe of Beckeſbourn in Kent. He formed it indeed into a complete hoſpital; appointing a phyſician, a ſurgeon, nurſes, and every thing proper, as well for food as phyſic. Nor did his charity ſtop here. Each man, on his recovery, was furniſhed with money to carry him home, in proportion to the diſtance of his abode."

To conclude with the character given by Mr Hume; "Archbiſhop Cranmer was undoubtedly a man of merit; poſſeſſed of learning and capacity; and adorned with candour, ſincerity, and beneficence, and all thoſe virtues which were fitted to render him uſeful and amiable in ſociety. His moral qualities procured him univerſal reſpect; and the courage of his martyrdom, though he fell ſhort of the rigid inflexibility obſerved in many, made him the hero of the Proteſtant party."

CRANNY, in glaſs-making, an iron inſtrument wherewith the necks of glaſſes are formed.

CRANTARA, among the ancient Britons, was a ſort of military ſignal uſed for collecting the diſtant and ſcattered warriors to the ſtandard of their chief. A prince having immediate occaſion for the aſſiſtance of his followers to repel ſome ſudden invaſion or engage in ſome expedition, beſides ſtriking the ſhield and ſounding the horn to give warning to thoſe who were within hearing, he ſent the crantara, or a ſtick burnt at the end and dipped in the blood of a goat, by a ſwift meſſenger, to the neareſt hamlet, where he delivered it without ſaying one word but the name of the place of rendezvous. This crantara, which was well underſtood to denounce deſtruction by fire and ſword to all who did not obey this ſummons, was carried with great rapidity from village to village; and the prince in a little time found himſelf ſurrounded by all his warriors ready to obey his commands.

CRANTOR, a Greek philoſopher and poet, was born at Solos in Cilicia. He left his native country where he was admired; went to Athens, and there ſtudied with Polemon under Xenocrates. He was conſidered as one of the chief ſupporters of the Platonic ſect; and was the firſt who wrote commentaries upon Plato's works. He flouriſhed 270 years before Chriſt.

CRAPE, a light tranſparent ſtuff, in manner of gauze: made of raw ſilk gummed and twiſted on the mill; woven without croſſing, and much uſed in mourning.

Crapes are either craped, i. e. criſped, or ſmooth; the firſt double, expreſſing a cloſer mourning; the latter ſingle, uſed for that leſs deep. Note, White is reſerved for young people, or thoſe devoted to virginity. The ſilk deſtined for the firſt is more twiſted than that for the ſecond; it being the greater or leſs degree of twiſting, eſpecially of the warp, which produces the criſping given it when taken out of the loom, ſteeped in clear water, and rubbed with a piece of wax for the purpoſe.

Crapes are all dyed raw. The invention of this ſtuff came originally from Bologna: but the chief manufacture of it is ſaid to be at Lyons.

Hiſtory tells us, that St Bathilda, queen of France, made fine crape (*crepa*) of gold and ſilver, to lay over the body of St Eloy. The Bollandiſts own they cannot find what this *crepa* was. Binet ſays, it was a frame to cover the body of the ſaint: but others, with reaſon, take it to be a tranſparent ſtuff, through which the body might be ſeen; and that this was the *crepa* whence our word crape was formed.

CRAPULA, among phyſicians, a term for SURFEIT.

CRASHAW, RICHARD, who was in his lifetime honoured with the friendſhip of Cowley, and ſince his death by the praiſe of Mr Pope, who condeſcended both to read his poems, and to borrow from them, was the ſon of William Craſhaw, an eminent divine, and educated at the Charter-houſe near London. He was then ſent to Pembroke-hall in Cambridge, and was afterwards of Peter-houſe, where he was fellow; in both which colleges he was diſtinguiſhed for his Latin and Engliſh poetry. Afterwards he was ejected from his fellowſhip, together with many others, for denying the covenant in the time of the rebellion; and he changed his religion, being by catholic artifices perverted to the church of Rome; not *converted*, but rather, as Pope ſays, *outwitted*. He went to Paris, in hopes of recommending himſelf to ſome preferment there; but being a mere ſcholar, was incapable of executing the new plan he had formed. There he fell into great diſtreſs, which Cowley the poet hearing of in 1646, very kindly ſought him out, gave him all the aſſiſtance he could, and at laſt got him recommended to Henrietta Maria queen of England, then reſiding at Paris. Obtaining from her letters of recommendation, he travelled into Italy; and by virtue of thoſe letters became ſecretary to a cardinal at Rome, and at laſt one of the canons or chaplains of the rich church of our lady at Loretto, ſome miles diſtance from thence, where he died and was buried about 1650. Before he left England, he wrote certain poems, entitled, "Steps to the Temple:" becauſe (ſays Wood) he led his life in the temple of God, in St Mary's church near to his college. There, as we learn from the preface to theſe poems, he lodged under Tertullian's roof of angels. There he made his neſt more gladly than David's ſwallow near the houſe of God; where, like a primitive ſaint, he offered more prayers in the night than others uſually offer in the day. There he penned the ſaid poems called "Steps to the Temple for Happy Souls to Climb to Heaven by." To the ſaid Steps are joined other poems called, "The Delight of the Muſes," wherein are ſeveral Latin poems: which though of a mere human mixture, yet they are ſweet as they are innocent. He hath alſo written *Carmen Deo Noſtro*, being hymns and other ſacred poems, addreſſed to the counteſs of Denbigh. He was excellent in five languages beſides his mother tongue, namely, Hebrew, Greek, Latin, Italian, and Spaniſh.

CRASIS (from κεραγνυμι, "to mix",) the temper of the blood peculiar to every conſtitution.

CRASIS, in *Grammar*, is a figure whereby two different letters are either contracted into one long letter or a diphthong. Such, e. g. is οφις for οφιας; αληθη for αληθεα, &c. τυχȣς for τυχεος, &c. where ι and α are contracted into ι; and ε and α into η; and ε and ο into ȣ.

CRASSAMENTUM, in *Phyſic*, the thick red or fibrous part of the blood, otherwiſe called *cruor*, in contradiſtinction to the ſerum or aqueous part.

CRASSULA, LESSER ORPINE, or *Live-ever*; a genus of plants, belonging to the pentandria claſs; and in the natural method ranking under the 13th order, *Succulentæ*. See BOTANY *Index*.

CRASSUS, M. LICINIUS, a celebrated Roman, ſurnamed *Rich* on account of his opulence. At firſt he was very circumſcribed in his circumſtances, but by educating ſlaves and ſelling them at a high price he ſoon enriched himſelf. The cruelties of Cinna obliged him to leave Rome, and he retired to Spain, where he remained concealed for eight months. After Cinna's death he paſſed into Africa, and thence to Italy, where he ſerved Sylla and ingratiated himſelf in his favour. When the gladiators with Spartacus at their head had ſpread an univerſal alarm in Italy and defeated ſome of the Roman generals, Craſſus was ſent againſt them. A battle was fought, in which Craſſus ſlaughtered 12,000 of the ſlaves, and by this deciſive blow ſoon put an end to the war, and was honoured with an *ovatio* at his return. He was ſoon after made conſul with Pompey in the year of Rome 682, and in this high office he diſplayed his opulence by entertaining the populace at 10,000 tables. He was afterwards cenſor, and formed the firſt triumvirate with Pompey and Cæſar. As his love of riches was more predominant than that of glory, Craſſus never imitated the ambitious conduct of his colleagues, but was ſatisfied with the province of Syria, which ſeemed to promiſe an inexhauſtible ſource of wealth. With hopes of enlarging his poſſeſſions he ſet off from Rome, though the omens proved unfavourable, and every thing ſeemed to threaten his ruin. He croſſed the Euphrates, and forgetful of the rich cities of Babylon and Seleucia, he haſtened to make himſelf maſter of Parthia. He was betrayed in his march by the delay of Artavaſdes king of Armenia, and the perfidy of Ariamnes. He was met in a large plain by Surena the general of the forces of Orodes king of Parthia, and a battle was fought in which 20,000 Romans were killed and 10,000 taken priſoners. The darkneſs of the night favoured the eſcape of the reſt; and Craſſus, forced by the mutiny and turbulence of his ſoldiers, and the treachery of his guides, truſted himſelf to the general of the enemy on pretence of propoſing terms of accommodation, and he was killed. His head was cut off and ſent to Orodes, who poured melted gold down his throat, and inſulted his misfortunes. Though he has been called avaricious, yet he ſhowed himſelf always ready of lending money to his friends without intereſt. He was fond of philoſophy, and his knowledge of hiſtory was great and extenſive.

CRATÆGUS, WILD-SERVICE tree, *Hawthorn*, &c. a genus of plants, belonging to the icoſandria claſs; and in the natural method ranking under the 36th order, *Pomaceæ*. See BOTANY *Index*.

The oxycanthus, hawthorn, or white thorn, grows naturally all over Europe. It is ſometimes cultivated as an ornamental tree, but it is chiefly propagated for the purpoſe of planting as a fence. In order to propagate a quantity of quick, one method is generally practiſed; namely, firſt burying the haws, and taking them up to ſow the October following; though, ſays Hanbury, there is another way more preferable; namely, to prepare the beds, and ſow the haws ſoon after they are gathered. Whoever purſues the former method, having gathered what quantity of haws will anſwer his purpoſe, ſhould in ſome bye-corner of the kitchen-garden or nurſery dig a hole or pit capacious enough to receive them; ſome of the earth which came out of the hole, after the haws are put in it, ſhould be laid upon them; and being thus carefully covered down, they may remain there till October. Then, having ground well dug, and cleared of the roots of all troubleſome weeds, and the mould being fit for working, the beds ſhould be made for the haws. Four feet is a very good width of theſe beds, as they may be eaſily reached over to be weeded; and if the alleys between be each one foot and a half wide, they will be of a good ſize. The beds being marked out with a line, ſufficient mould muſt be raked out to cover the haws an inch and a half deep. This being done, and the bottom of the beds being made level and even, the haws ſhould be ſown, and afterwards gently tapped down with the back of the ſpade; and then the fine mould, which had been raked out of the beds, muſt be thrown over them, covering them an inch and a half deep. In the ſpring the plants will come up, and in the ſummer following ſhould be kept clear of weeds; though it does ſometimes happen, that few of them will appear till the ſecond ſpring after ſowing. Sometimes the young plants are planted out from the ſeed-beds at one, two, or three years old; but the beſt plants are obtained by tranſplanting them into freſh mould the firſt or ſecond year, letting them remain in the nurſery two or three years longer. The practice of the London nurſerymen is this: The ſtrongeſt of the ſeed-bed plants having been drawn at two or three years old for ſale, they clean the beds entirely by drawing the remaining weak underling plants, and tranſplanting them into freſh beds in this manner, which they call *bedding them*: The ground having been trenched, and the tips of the plants as well as the lower fibres of their roots having been taken off with a ſharp knife, they ſtrain a line along one ſide of the bed; and by chopping with a ſpade by the ſide of the line, leave a clift or drill of a depth proportioned to the length of the plants to be laid in; and drawing the looſe mould ſomewhat towards them, leave the ſide of the drill next to the line with a ſmooth poliſhed face. Againſt this face the plants are ſet up, leaning towards the line, about three inches aſunder, leaving their heads about an inch above the mould, and placing their roots at ſuch a depth as to bury their ſtems from two to three inches deeper than they ſtood in the ſeed-bed. The looſe mould being returned and preſſed gently to the roots with the foot, the line is removed, and another row planted in the ſame manner about a foot from the firſt.

CRATCHES, in the manege, a ſwelling on the paſtern, under the fetlock, and ſometimes under the hoof; for which reaſon it is diſtinguiſhed into the ſinew cratches, which affect the ſinew, and thoſe upon the coronet, called *quittor-bones*.

CRATER, CUP, in *Aſtronomy*, a conſtellation of the ſouthern hemiſphere; whoſe ſtars, in Ptolemy's catalogue, are ſeven; in Tycho's, eight; in Hevelius's, ten; in the Britannic catalogue, thirty-one.

CRATER is alſo uſed to ſignify the mouth or opening of a volcano or burning mountain, from whence the fire is diſcharged. See VOLCANO.

CRATES, of Thebes, a famous philoſopher, was the diſciple of Diogenes the Cynic. It is ſaid that he threw all his money into the ſea, that he might the more freely apply himſelf to the ſtudy of philoſophy. Others aſſert that he placed it into another perſon's hands, with orders to give it to his children if they ſhould happen to be fools: For (ſaid Crates), if they ſhould be philoſophers, they will have no need of it: in which caſe it was to be given to the people. He flouriſhed about 328 years before Chriſt.

He ought not to be confounded with Crates, a famous Academic philoſopher, the diſciple and friend of Polemon. This laſt Crates had Arceſilaus and other celebrated philoſophers for his diſciples; and flouriſhed about 300 years before Chriſt.

CRATEVA, the GARLIC PEAR; a genus of plants belonging to the dodecandria claſs; and in the natural method ranking under the 25th order, *Putamineæ*. See BOTANY *Index*.

CRATINUS, an ancient comic poet, of whom we ſhould ſcarcely have known any thing, had not Quintilian, Horace, and Perſius, mentioned him, Eupolis, and Ariſtophanes, as the great maſters of what we call the ancient comedy. It is gathered that he died in the 87th Olympiad. Suidas tells us that he wrote 21 plays, and that he was ſplendid and bright in his characters.

CRATIPPUS, a celebrated Peripatetic philoſopher, was a native of Mitylene, where he taught philoſophy: but at length went to Athens where Brutus and the ſon of Cicero were his diſciples. Pompey went to ſee him after the battle of Pharſalia, and propoſed to him his difficulties in relation to the belief of a Providence: when Cratippus comforted him, and by forcible arguments anſwered his objections. He wrote ſome pieces about divination: and is ſuppoſed to be the ſame with him whom Tertullian, in his book *De Anima*, has ranked among the writers upon dreams.

CRATO, a ſmall town of Portugal, in the province of Alentejo, with a rich priory. It is the chief commandery which the knights of Malta have in Portugal. W. Long. 8. 12. N. Lat. 38. 50.

CRAVEN, a town of France, in Burgundy, remarkable for its good wine, and for a battle fought there between the Engliſh and French. It is ſeated near the confluence of the rivers Cure and Yonne. E. Long. 3. 30. N. Lat. 47. 42.

CRAVEN, or CRAVENT, a word of reproach, uſed in trials by battel. See BATTEL.

CRAX, the *curaſſou*, a genus of birds, belonging to the order of gallinæ. See ORNITHOLOGY *Index*.

CRAY-FISH, or *Craw-Fiſh*. See CANCER, ENTOMOLOGY *Index*.

CRAYER, CASPAR DE, a celebrated painter, was born at Antwerp in 1585, and was a diſciple of Raphael Coxis, the ſon of that Coxis who had ſtudied under Raphael; but he ſoon ſhowed ſuch proofs of genius, and of an elevated capacity, that he far ſurpaſſed his maſter. Afterwards he made judicious obſervations on the particular excellencies of the moſt renowned maſters to which he had any acceſs; and taking nature for his conſtant director and guide, he formed for himſelf a manner that was exceedingly pleaſing. The firſt work which eſtabliſhed him in the favour of the court at Bruſſels, was a portrait of Cardinal Ferdinand, brother to the king of Spain, which he painted at full length, and as large as life. In that picture he ſucceeded ſo happily, that it was ſent to Madrid, and received there with ſuch concurrent approbation of the king and the whole court, that it laid the foundation of the fame and fortune of Crayer. For the king, as an acknowledgment of the painter's merit, ſent him a gold chain with a medal; and added, as a farther inſtance of his favour, an appointment for a conſiderable penſion. But nothing places the talents of Crayer in a ſtronger light, than the teſtimony of ſo excellent an artiſt as Rubens. That great man went to Antwerp particularly to viſit Crayer, and to ſee his works; and after examining attentively a picture of his painting, in the refectory of the abbey of Afflegham, he publicly declared that no painter could ſurpaſs Crayer. Nor was this maſter leſs diſtinguiſhed by Vandyck, who always expreſſed a real eſteem and friendſhip for him, and painted his portrait. He had ſomewhat leſs fire in his compoſition than Rubens, but his deſign is frequently more correct. His compoſitions generally conſiſted of a ſmall number of figures; and with diſcreet judgment, he avoided the encumbering his deſign with ſuperfluous particulars, or loading his ſubject with any thing that ſeemed not to contribute to its elegance or probability. He grouped his figures with ſingular ſkill, and his expreſſions have all the truth of nature. There is a remarkable variety in his draperies, and an equal degree of ſimplicity in their folds; and as to his colouring, it is admirable. Of all his cotemporary painters, he was accounted to approach neareſt to Vandyck, not only in hiſtory but in portrait. He principally painted religious ſubjects, and was continually at work; and although he lived to a great age, yet his temperance and conſtant regularity preſerved to him the full uſe of all his faculties; and to the laſt month of his life his pencil retained the ſame force and freedom which it poſſeſſed in his moſt vigorous time. The ſubject of that picture which was ſo honoured by the approbation of Rubens is the Centurion alighting from his horſe to proſtrate himſelf at the feet of our Saviour. It is a capital deſign of Crayer; and although it conſiſts of a great number of figures, the harmony and union are well preſerved.

CRAYON, a general name for all coloured ſtones, earths, or other minerals and ſubſtances, uſed in deſigning or painting in paſtel; whether they have been beaten and reduced to a paſte, or are uſed in their primitive conſiſtence, after ſawing or cutting them into long narrow ſlips. In this laſt manner are red crayons made, of blood-ſtone or red chalk; black ones, of charcoal and black lead. Crayons of all other colours are compoſitions of earths reduced to paſte.

Crayon-Painting. Whether the painter works with oil-colours, water-colours, or crayons, the grand object of his purſuit is ſtill the ſame: a juſt imitation of nature. But each ſpecies has its peculiar rules and methods. Painting with crayons requires in many reſpects a treatment different from painting in oil-colours; becauſe all colours uſed dry are in their nature of a much warmer complexion than when wet with oils, &c. For this reaſon, in order to produce a rich picture, a much greater portion of what painters term *cooling teints* muſt be applied in crayon painting than would be judicious to uſe in oils. Without any danger of a miſtake, it is to be ſuppoſed, the not being acquainted with this obſervation is one great cauſe why ſo many oil painters have no better ſucceſs when they attempt crayon-painting. On the contrary, crayon painters being ſo much uſed to thoſe teints which are of a cold nature when uſed wet, are apt to introduce them too much when they paint oils, which is ſeldom productive of a good effect.

We ſhall now endeavour to give the ſtudents ſome directions towards the attainment of excellence in this art.

Of the Application of the Crayons, with ſome previous Diſpoſitions. The ſtudent muſt provide himſelf with ſome ſtrong blue paper, the thicker the better, if the grain is not too coarſe or knotty, though it is almoſt impoſſible to get any entirely free from knots. The knots ſhould be levelled with a penknife or razor, otherwiſe they will prove exceedingly troubleſome. After this is done, the paper muſt be paſted very ſmooth on a linen cloth, previouſly ſtrained on a deal frame, the ſize according to the artiſt's pleaſure: on this the picture is to be executed; but it is moſt eligible not to paſte the paper on till the whole ſubject is firſt dead coloured. The method of doing this is very eaſy, by laying the paper with the dead colour on its face, upon a ſmooth board or table, when, by means of a bruſh, the back ſide of the paper muſt be covered with paſte; the frame, with the ſtrained cloth, muſt then be laid on the paſted ſide of the paper; after which turn the painted ſide uppermoſt, and lay a piece of clean paper upon it, to prevent ſmearing it: this being done, it may be ſtroked gently over with the hand; by which means all the air between the cloth and the paper will be forced out.

When the paſte is perfectly dry, the ſtudent may proceed with the painting. The advantages ariſing from paſting the paper on the frame according to this method, after the picture is begun, are very great, as the crayons will adhere much better than any other way; which will enable the ſtudent to finiſh the picture with a firmer body of colour and greater luſtre.

When the painters want to make a very correct copy of a picture, they generally make uſe of tiffany or black gauze, ſtrained tight on a frame, which they lay flat on the ſubject to be imitated, and with a piece of ſketching chalk trace all the outlines on the tiffany. They then lay the canvas to be painted on flat upon the floor, placing the tiffany with the chalked lines upon it, and with an handkerchief bruſh the whole over; this preſents the exact outlines of the picture on the canvas. The crayon-painter may alſo make uſe of this method when the ſubject of his imitation is in oils; but in copying a crayon-picture, he muſt have recourſe to the following method, on account of the glaſs.

The picture being placed upon the eaſel, let the outlines be drawn on the glaſs with a ſmall camel's hair pencil dipped in lake, ground thin with oils, which muſt be done with great exactneſs. After this is accompliſhed, take a ſheet of paper of the ſame ſize, and place it on the glaſs, ſtroking over all the lines with the hand, by which means the colour will adhere to the paper, which muſt be pierced with pin-holes pretty cloſe to each other. The paper intended to be uſed for the painting muſt next be laid upon a table, and the pierced paper placed upon it; then with ſome fine-pounded charcoal, tied up in a piece of lawn, rub over the pierced lines, which will give an exact outline; but great care muſt be taken not to bruſh this off till the whole is drawn over with ſketching chalk, which is a compoſition made of whiting and tobacco-pipe clay, rolled like the crayons, and pointed at each end.

When a ſtudent paints immediately from the life, it will be moſt prudent to make a correct drawing of the outlines on another paper, the ſize of the picture he is going to paint, which he may trace by the preceding method, becauſe erroneous ſtrokes of the ſketching chalk (which are not to be avoided without great expertneſs) will prevent the crayons from adhering to the paper, owing to a certain greaſy quality in the compoſition.

The ſtudent will find the ſitting poſture, with the box of crayons in his lap, the moſt convenient method for him to paint. The part of the picture he is immediately painting ſhould be rather below his face; for, if it is placed too high, the arm will be fatigued. Let the windows of the room where he paints be darkened, at leaſt to the height of ſix feet from the ground; and the ſubject to be painted ſhould be ſituated in ſuch a manner, that the light may fall with every advantage on the face, avoiding too much ſhadow, which ſeldom has a good effect in portrait painting, eſpecially if the face he paints from has any degree of delicacy.

Before he begins to paint, let him be attentive to his ſubject, and appropriate the action or attitude proper to the age of the ſubject: if a child, let it be childiſh; if a young lady, expreſs more vivacity than in the majeſtic beauty of a middle-aged woman, who alſo ſhould not be expreſſed with the ſame gravity as a perſon far advanced in years. Let the embelliſhments of the picture, and introduction of birds, animals, &c. be regulated by the rules of propriety and conſiſtency.

The features of the face being correctly drawn with chalks, let the ſtudent take a crayon of pure carmine, and carefully draw the noſtril and edge of the noſe next the ſhadow; then, with the fainteſt carmine teint, lay in the higheſt light upon the noſe and forehead, which muſt be executed broad. He is then to proceed gradually with the ſecond teint, and the ſucceeding ones, till he arrives at the ſhadows, which muſt be covered brilliant, enriched with much lake, carmine, and deep green. This method will at firſt offenſively ſtrike the eye, from its crude appearance; but in the finiſhing, it will be a good foundation to produce a pleaſing effect, colours being much more eaſily ſullied when too bright than when the firſt colouring is dull, to raiſe the picture into a brilliant ſtate. The ſeveral pearly teints diſcernible in fine complexions muſt be imitated with blue verditer and white, which anſwers to the ultramarine teints uſed in oils. But if the parts of the face where theſe teints appear are in ſhadow, the crayons compoſed of black and white muſt be ſubſtituted in their place.

Though all the face when firſt coloured ſhould be laid in as brilliant as poſſible, yet each part ſhould be kept in its proper tone; by which means the rotundity of the face will be preſerved.

Let the ſtudent be careful, when he begins the eyes, to draw them with a crayon inclined to the carmine teint, of whatever colour the iriſes are of; he muſt lay them in brilliant, and at firſt not loaded with colour, but executed lightly: no notice is to be taken of the pupil yet. The ſtudent muſt let the light of the eye incline very much to the blue caſt, cautiouſly avoiding a ſtaring white appearance (which, when once introduced, is ſeldom overcome), preſerving a broad ſhadow thrown on its upper part by the eye-laſh. A black and heavy teint is alſo to be avoided in the eyebrows; it is therefore beſt to execute them like a broad glowing ſhadow at firſt, on which, in the finiſhing, the hairs of the brow are to be painted; by which method of proceeding, the former teints will ſhow themſelves through, and produce the moſt pleaſing effect.

The ſtudent ſhould begin the lips with pure carmine and lake, and in the ſhadow uſe ſome carmine and black; the ſtrong vermilion teints ſhould be laid on afterwards. He muſt beware of executing them with ſtiff, harſh lines, gently intermixing each with the neighbouring colours, making the ſhadow beneath broad, and enriched with brilliant crayons. He muſt form the corner of the mouth with carmine, brown ochre, and greens, variouſly intermixed. If the hair is dark, he ſhould preſerve much of the lake and deep carmine teints therein; this may eaſily be overpowered by the warmer hair-teints, which, as obſerved in painting the eyebrows, will produce a richer effect when the picture is finiſhed; on the contrary, if this method is unknown or neglected, a poverty of colouring will be diſcernible.

After the ſtudent has covered over, or, as artiſts term it, has dead-coloured the head, he is to ſweeten the whole together, by rubbing it over with his finger, beginning at the ſtrongeſt light upon the forehead, paſſing his finger very lightly, and uniting it with the next teint, which he muſt continue till the whole is ſweetened together, often wiping his finger on a towel to prevent the colours being ſullied. He muſt be cautious not to ſmooth or ſweeten his picture too often, becauſe it will give riſe to a thin and ſcanty effect, and have more the appearance of a drawing than a ſolid painting; as nothing but a body of rich colours can conſtitute a rich effect. To avoid this (as the ſtudent finds it neceſſary to ſweeten with the finger), he muſt commonly repleniſh the picture with more crayon.

When the head is brought to ſome degree of forwardneſs, let the back-ground be laid in, which muſt be treated in a different manner, covering it as thin as poſſible, and rubbing it into the paper with a leather ſtump. Near the face the paper ſhould be almoſt free from colour, for this will do great ſervice to the head, and by its thinneſs give both a ſoft and ſolid appearance. In the back ground alſo, no crayon that has whiting in its compoſition ſhould be uſed, but chiefly ſuch as are the moſt brilliant and the leaſt adulterated. The ground being painted thin next the hair, will give the ſtudent an opportunity of painting the edges of the hair over in a light and free manner when he gives the finiſhing touches.

The ſtudent having proceeded thus far, the face, hair, and back ground being entirely covered, he muſt carefully view the whole at ſome diſtance, remarking in what reſpect it is out of keeping, that is, what parts are too light and what too dark, being particularly attentive to the white or chalky appearances, which muſt be ſubdued with lake and carmine. The above method being properly put into execution, will produce the appearance of a painting principally compoſed of three colours, viz. carmine, black, and white, which is the beſt preparation a painter can make for the producing a fine crayon picture.

The next ſtep is, to complete the back-ground and the hair, as the duſt, in painting theſe, will fall on the face, and would much injure it if that was completed firſt. From thence proceed to the forehead, finiſhing downward till the whole picture is completed.

In painting over the forehead the laſt time, begin the higheſt light with the moſt faint vermilion teint, in the ſame place where the faint carmine was firſt laid, keeping it broad in the ſame manner. In the next ſhade ſucceeding the lighteſt, the ſtudent muſt work in ſome light blue teints, compoſed of verditer and white, intermixing with them ſome of the deeper vermilion teints, ſweetening them together with great caution, inſenſibly melting them into one another, increaſing the proportion of each colour as his judgment ſhall direct. Some brilliant yellows may alſo be uſed, but ſparingly; and towards the roots of the hair, ſtrong verditer teints, intermixed with greens, will be of ſingular ſervice. Cooling crayons, compoſed of black and white, ſhould ſucceed theſe, and melt into the hair. Beneath the eyes, the ſweet pearly teints are to be preſerved, compoſed of verditer and white, and under the noſe, and on the temples, the ſame may be uſed; beneath the lips, teints of this kind alſo are proper, mixing them with the light greens and ſome vermilion.

In finiſhing the cheeks, let the pure lake clear them from any duſt contracted from the other crayons; then with the lake may be intermixed the bright vermilion; and laſt of all (if the ſubject ſhould require it) a few touches of the orange-coloured crayon, but with extreme caution; after, ſweeten that part with the finger as little as poſſible, for fear of producing a heavy diſagreeable effect on the cheeks; as the beauty of a crayon-picture conſiſts in one colour ſhowing itſelf through, or rather between, another: this the ſtudent cannot too often remark, it being the only method of imitating beautiful complexions.

The eye is the moſt difficult feature to execute in crayons, as every part muſt be expreſſed with the utmoſt nicety, to appear finiſhed; at the ſame time that the painter muſt preſerve its breadth and ſolidity while he is particularizing the parts. To accompliſh this, it will be a good general rule for the ſtudent to uſe his crayon in ſweetening as much, and his finger as little, as poſſible. When he wants a point to touch a ſmall part with, he may break off a little of his crayon againſt the box, which will produce a corner fit to work with in the minuteſt parts. If the eye-laſhes are dark, he muſt uſe ſome of the carmine and brown ochre, and the crayon of carmine and black; and with theſe he may alſo touch the iris of the eye (if brown or hazel), making a broad ſhadow, cauſed by the eye-laſh. Red teints of vermilion, carmine, and lake, will execute the corners of the eye properly; but if the eyelids are too red, they will have a diſagreeable ſore appearance. The pupil of the eye muſt be made of pure lamp-black: between this and the lower part of the iris, the light will catch very ſtrong, but it muſt not be made too ſudden, but be gently diffuſed round the pupil till it is loſt in ſhade. When the eye-balls are ſufficiently prepared, the ſhining ſpeck muſt be made with a pure white crayon, which ſhould be firſt broken to a point, and then laid on firm; but as it is poſſible they may be defective in neatneſs, they ſhould be corrected with a pin, taking off the redundant parts, by which means they may be formed as neat as can be required.

The difficulty, with reſpect to the noſe, is to preſerve the lines properly determined, and at the ſame time ſo artfully blended into the cheek, as to expreſs its projection, and yet no real line to be perceptible upon a cloſe examination; in ſome circumſtances it ſhould be quite blended with the cheek, which appears behind it, and determined entirely with a ſlight touch of red chalk. The ſhadow cauſed by the noſe is generally the darkeſt in the whole face, partaking of no reflection from its ſurrounding parts. Carmine and brown ochre, carmine and blacks, and ſuch brilliant crayons, will compoſe it beſt.

The ſtudent having before prepared the lips with the ſtrongeſt lake and carmine, &c. muſt with theſe colours make them completely correct; and when finiſhing, introduce the ſtrong vermilions, but with great caution, as they are extremely predominant. This, if properly touched, will give the lips an appearance equal, if not ſuperior, to thoſe executed in oils, notwithſtanding the ſeeming ſuperiority the latter has, by means of glazing (A), of which the former is entirely deſtitute.

When the ſtudent paints the neck, he ſhould avoid expreſſing the muſcles too ſtrong in the ſtem, nor ſhould the bones appear too evident on the cheſt, as both have an unpleaſing effect, denoting a violent agitation of the body; a circumſtance ſeldom neceſſary to expreſs in portrait-painting. The moſt neceſſary part to be expreſſed, and which ſhould ever be obſerved, (even in the moſt delicate ſubjects), is a ſtrong marking juſt above the place where the collar bones unite; and if the head is much thrown over the ſhoulders, ſome notice ſhould be taken of the large muſcle that riſes from behind the ear, and is inſerted into the pit between the collar bones. All inferior muſcles ſhould be, in general, quite avoided. The ſtudent will find this caution neceſſary, as moſt ſubjects, eſpecially thin perſons, have the muſcles of the neck much more evident than would be judicious to imitate. As few necks are too long, it may be neceſſary to give ſome addition to the ſtem, a fault on the other ſide being quite unpardonable, nothing being more ungraceful than a ſhort neck. In colouring the neck, let the ſtudent preſerve the ſtem of a pearly hue, and the light not ſo ſtrong as on the cheſt. If any part of the breaſt appears, its tranſparency muſt alſo be expreſſed by pearly teints; but the upper part of the cheſt ſhould be coloured with beautiful vermilions delicately blended with the other.

Of the Drapery. Dark blue, purple, black, pink, and all kinds of red draperies alſo, ſhould be firſt tinged with carmine, which will render the colours much more brilliant than any other method; over this ſhould be laid on the paper the middle teint (a medium between the light and dark teints, of which the drapery is to be painted, except the dark maſſes of ſhadow, which ſhould be laid on at firſt as deep as poſſible; theſe, ſweetened with the finger, being deſtitute of the ſmaller folds, will exhibit a maſterly breadth, which the leſſer folds when added ought by no means to deſtroy. With the light and dark teints, the ſmaller parts are next to be made with freedom, executing as much with the crayon, and as little with the finger, as poſſible; in each fold touching the laſt ſtroke with the crayon, which ſtroke the finger muſt never touch. In the caſe of reflections, the ſimple touch of the crayon will be too harſh, therefore fingering will be neceſſary afterwards, as reflected lights are always more gentle than thoſe which are direct. With reſpect to reflections in general, they muſt always partake of the ſame colour as the object reflecting, but in the caſe of ſingle figures, it may be uſeful to make ſome particular obſervations.

In a blue drapery, let the reflections be of a greeniſh caſt; in green draperies, make them of a yellow teint; in yellow, of an orange; in orange, reflect a reddiſh caſt; all reds, ſomething of their own nature, but inclined to the yellow: black ſhould have a reddiſh reflection; the reflection of a reddiſh teint will alſo preſent purples to the beſt advantage.

Of whatever colour the drapery is, the reflection on the face muſt partake thereof, otherwiſe the picture,

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(A) The method with which painters in oils expreſs tranſparency in the lips is, by painting them firſt with light vermilion teints, and, when dry, touching them over with pure lake.

ture, like paintings on glaſs, will have but a gaudy effect.

Linen, lace, fur, &c. ſhould be touched ſpiritedly with the crayon, fingering very little, except the latter; and the laſt touches, even of this, like all other parts, ſhould be executed with the crayon, without ſweetening with the finger.

The methods above recommended have been practiſed by the moſt celebrated crayon-painters, whoſe works have been held in public eſtimation; but the knowledge of, and ability to execute, each ſeparate part with brilliancy and truth, will be found very inſufficient to conſtitute a complete painter, without his judgment enables him to unite them with each other, by correctneſs of drawing, propriety of light and ſhadow, and harmony of colouring. In order to accompliſh this, the ſtudent ſhould carefully avoid finiſhing one part in particular, till he has properly conſidered the connection it is to have with the reſt. The neglect of this is the principal reaſon why the performances of indifferent painters are ſo deſtitute of what is termed breadth, ſo conſpicuouſly beautiful in the works of great maſters. It muſt be granted, that this obſervation relates more particularly to large compoſitions, where a diverſity of figures requires ſuch a judicious diſpoſition, that each may aſſiſt in the combination of a kind of univerſal harmony; yet, even in portrait-painting, the ſtudent ſhould be particularly attentive to obſerve this idea of breadth, if he is deſirous of acquiring that importance and dignity which conſtitutes excellence in painting.

Of the Materials. The perfection of the crayons conſiſts, in a great meaſure, in their ſoftneſs; for it is impoſſible to execute a brilliant picture with them if they are otherwiſe; on which account great care ſhould be obſerved in the preparing them, to prevent their being hard. In all compoſitions, flake-white and white-lead ſhould be wholly rejected, becauſe the ſlighteſt touch with either of theſe would unavoidably turn black.

The uſual objection to crayon-paintings is, that they are ſubject to change; but whenever this happens, it is entirely owing to an injudicious uſe of the above-mentioned whites, which will ſtand only in oils. To obviate the bad effects ariſing from the uſe of ſuch crayons, let the ſtudent make uſe of common whiting prepared in the following manner.

Take a large veſſel of water, put the whiting into it, and mix them well together; let this ſtand about half a minute, then pour off the top into another veſſel, and throw the gritty ſediment away; let what is prepared reſt about a minute, and then pour it off as before, which will purify the whiting and render it free from all dirt and grittineſs. When this is done let the whiting ſettle, and then pour the water from it; after which, lay it on the chalk to dry, and keep it for uſe, either for white crayons, or the purpoſe of preparing teints with other colours, for with this all other teints may be ſafely prepared. If the ſtudent chooſes to make crayons of the whiting immediately after it is waſhed, it is not neceſſary to dry it on the chalk, for it may be mixed inſtantly with any other colour, which will ſave conſiderable trouble. All colours of a heavy or gritty nature, eſpecially blue verditer, muſt be purified by waſhing after this method.

The ſtudent muſt be provided with a large, flexible pallet-knife, a large ſtone and muller to levigate the colours, two or three large pieces of chalk to abſorb the moiſture from the colours after they are levigated, a piece of flat glaſs to prevent the moiſture from being abſorbed too much, till the colours are rolled into form, and veſſels for water, ſpirits, &c. as neceſſity and convenience ſhall direct.

I. Reds. It is rather difficult to procure either good carmine or good lake. Good carmine is inclined to the vermilion teint, and good lake to the carmine teint. The carmine crayons are prepared in the following manner.

1. Carmine. As their texture is inclinable to hardneſs, inſtead of grinding and rolling them, take a ſufficient quantity of carmine, lay it upon the grinding-ſtone, mix it with a levigating knife with ſpirits of wine till it becomes ſmooth and even. The chalk-ſtone being ready, lay the colour upon it to abſorb the ſpirit; but be careful that it is laid on in a proper ſtate for painting. If it is levigated too thin, the crayons will be too flat; and if too thick, it will occaſion a waſte of colour, by their adhering to the pallet knife; but practice will render the proper degree of conſiſtency familar. The ſimple colour being prepared, the next ſtep is to compoſe the different teints by a mixture with whiting; the proportion to be obſerved conſiſting of 20 gradations to one, which may be clearly underſtood by the following directions. Take ſome of the ſimple colour, and levigate it with ſpirit of wine, adding about one part of waſhed whiting to three parts of carmine, of which, when properly incorporated, make two parcels. The next gradation ſhould be compoſed of equal quantities of carmine and whiting, of which four crayons may be made. The third compoſition ſhould have one fourth carmine and three fourths whiting; of this make ſix crayons, which will be a good proportion for the reſt. The laſt teint ſhould be made of whiting, very faintly tinged with carmine, of which make about eight crayons, which will complete the above-mentioned proportion. As theſe compound teints are levigated, they are to be laid immediately upon the chalk, that the moiſture may be abſorbed to the proper degree of dryneſs for forming into crayons, which may be known by its loſing the greater part of its adheſive quality when taken into the hand; if the conſiſtency is found to be right, it may be then laid upon the glaſs, which having no pores, will prevent the moiſture from being carried off before it is convenient to form it into crayons, otherwiſe the crayons would be full of cracks and very brittle, which will be a great inconvenience when they are uſed in painting.

2. Lake. This is a colour very apt to be hard; to prevent which the ſtudent muſt obſerve the following particulars. Take about half the quantity of lake intended for the crayons, and grind it very fine with ſpirits of wine; let it dry, and then pulverize it, which is eaſily done if the lake is good; then take the other half, and grind it with ſpirits, after which mix it with the pulverized lake, and lay it out directly in crayons on the chalk. This colour will not bear rolling. The ſimple colour being thus prepared, proceed with the compound crayons as directed before, and in the ſame degrees of gradation as the carmine teints.

3. Vermilion. The beſt is inclined to the carmine teint. Nothing is required to prepare this colour more than to mix it on the ſtone with ſoft water or ſpirits, after which it may be rolled into crayons. The different teints are produced by a mixture of the ſimple colour with whiting, according to the proportion already given.

II. Blues. 1. Pruſſian blue is a colour very apt to bind, and is rendered ſoft with more difficulty than carmine and lake. The ſame method of preparation is to be followed with this as is directed with reſpect to lake, only it is neceſſary to grind a larger quantity of the pure colour, as it is chiefly uſed for painting draperies. The different teints may be made according to neceſſity, or the fancy of the painter. 2. Blue verditer is a colour naturally gritty, and therefore it is neceſſary to waſh it well. Its particles are ſo coarſe as to require ſome binding matter to unite them, otherwiſe the crayons will never adhere together. To accompliſh this, take a quantity ſufficient to form two or three crayons, to which add a piece of ſlaked plaſter of Paris about the ſize of a pea; mix theſe well together, and form the crayons upon the chalk. This blue is extremely brilliant, and will be of great uſe in heightening draperies, &c. The teints muſt be formed with whiting as directed in the former inſtances, and are highly ſerviceable for painting fleſh, to produce thoſe pearly teints ſo beautiful in crayon pictures. It is not neceſſary to mix the compounds with ſpirits, as clear water will be ſufficient.

III. Greens. Brilliant greens are produced with great difficulty. In Switzerland, they have a method of making them far ſuperior to ours. We uſually take yellow ochre, and after grinding it with ſpirits, mix it with the powder of Pruſſian blue, then temper it with a knife, and lay the crayons on the chalk, without rolling them. Inſtead of this, ſome uſe king's yellow mixed with Pruſſian blue, and others brown ochre and Pruſſian blue. The crayons made of the two laſt may be rolled. Various teints may be produced by theſe colours, according to fancy or neceſſity; ſome to partake more of the blue, and others of the yellow.

IV. Yellows. 1. King's yellow is the moſt uſeful and the moſt brilliant, levigated with ſpirits of wine, to compoſe the different teints as before directed. 2. Yellow ochre, and Naples yellow ground with ſpirits, will make uſeful crayons. 3. Orange is produced with king's yellow and vermilion ground together with ſpirits, and the teints formed as in other caſes, but no great quantity of them is required.

V. Browns. 1. Cullen's earth is a fine dark brown. After ſix or eight of the ſimple crayons are prepared, ſeveral rich compound teints may be produced from it, by a mixture with carmine, in various degrees. Black, carmine, and this colour, mixed together, make uſeful teints for painting hair; ſeveral gradations may be produced from each of theſe by a mixture with whiting. Roman or brown ochre is an excellent colour, either ſimple or compounded with carmine. Whiting tinged in ſeveral degrees with either of theſe, will prove very ſerviceable in painting. 2. Umber may be treated in juſt the ſame manner; only it is neceſſary to levigate it with ſpirit of wine.

VI. Purples. Pruſſian blue ground with ſpirits and mixed with pulverized lake, will produce a good purple. Carmine, thus mixed with Pruſſian blue, will produce a purple ſomething different from the former. Various teints may be made from either of theſe compounds by a mixture with whiting.

VII. Black. 1. Lamp-black is the only black that can be uſed with ſafety, as all others are ſubject to mildew; but as good lamp-black is very ſcarce, the ſtudent will, perhaps, find it moſt expedient to make it himſelf; the proceſs of which is as follows: Provide a tin cone, fix it over a lamp at ſuch a height that the flame may juſt reach the cone for the ſoot to gather within it. When a ſufficient quantity is collected, take it out, and burn all the greaſe from it in a crucible. It muſt then be ground with ſpirits, and laid on the chalk to abſorb the moiſture. Various gray teints may be formed from this by a mixture with whiting, as mentioned in former inſtances.—2. Vermilion mixed with carmine: this is a compoſition of great uſe, and teints made from this with whiting will be found to be very ſerviceable. 3. Carmine and black is another good compound, of which five or ſix gradations ſhould be made, ſome partaking more of the black, and others having the carmine moſt predominant, beſides ſeveral teints by a mixture with whiting. 4. Vermilion and black is alſo a very uſeful compound, from which ſeveral different teints ſhould be made. 5. Pruſſian blue and black is another good compound, and will be found of ſingular ſervice in painting draperies.

It is impoſſible to lay down rules for the forming every teint neceſſary in compoſing a ſet of crayons, there being many accidental compoſitions, entirely dependent on fancy and opinion. The ſtudent ſhould make it a rule to ſave the leavings of his colours; for of theſe he may form various teints, which will occaſionally be uſeful.

Of Rolling the Crayons, and diſpoſing them for painting. The different compoſitions of colours muſt be cut into a proper magnitude, after they are prepared, in order to be rolled into paſtils, for the convenience of uſing them. Each crayon ſhould be formed in the left hand with the ball of the right, firſt formed cylindrically, and then tapering at each end. If the compoſition is too dry, dip the finger in water; if too wet, the compoſition muſt be laid upon the chalk again to abſorb more of the moiſture. The crayons ſhould be rolled as quick as poſſible; and when finiſhed, muſt be laid upon the chalk again, to abſorb all remaining moiſture. After the gradation of teints from one colour is formed, the ſtone ſhould be well ſcraped and cleanſed with water before it is uſed for another colour.

When the ſet of crayons is completed according to the rules preſcribed, they ſhould be arranged in claſſes for the convenience of painting with them. Some thin drawers, divided into a number of partitions, is the moſt convenient method of diſpoſing them properly. The crayons ſhould be depoſited according to the ſeveral gradations of light. The bottom of the partitions muſt be covered with bran, as a bed for the colours; becauſe it not only preſerves them clean, but prevents their breaking.

The box made uſe of when the ſtudent paints ſhould be about a foot ſquare, with nine partitions. In the upper corner on the left hand (ſuppoſing the box to be in the lap when he paints), let him place the black and gray crayons, thoſe being the moſt ſeldom uſed; in the ſecond partition, the blues; in the third, the greens and browns; in the firſt partition on the left hand of the ſecond row, the carmines, lakes, vermilions, and all deep reds; the yellows and orange in the middle, and the pearly teints next; and as theſe laſt are of a very delicate nature, they muſt be kept very clean, that the gradations of colour may be eaſily diſtinguiſhed; in the lower row, let the firſt partition contain a piece of fine linen rag to wipe the crayons with while they are uſing; the ſecond, all the pure lake and vermilion teints; and the other partition may contain thoſe teints which, from their complex nature, cannot be claſſed with any of the former.

CRAZE MILL, or *Crazing Mill*, a mill in all reſpects like a griſt-mill to grind corn, and ſo called by the tin miners, who uſe it to grind their tin, which is yet too great after trambling.

CREAM, a general name applicable to all ſubſtances that ſeparate from a liquor, and are collected upon its ſurface; but more particularly applied to the following.

Cream of Lime, is that part of the lime which had been diſſolved in the water in its cauſtic ſtate, but having again attracted ſome fixed air from the atmoſphere, becomes incapable of ſolution, and therefore ſeparates from the water in the mild ſtate of chalk or limeſtone.

Cream of Milk, generally called ſimple *cream*, is the moſt oily part of the milk; which being naturally only mixed, and not diſſolved in the reſt, ſoon ſeparates from them, as being ſpecifically lighter; after which it collects on the ſurface; from which it is generally ſkimmed, to complete the diſengagement of the oily parts, for the purpoſe of making butter, from the caſeous and ſerous parts. See AGRICULTURE *Index*. Cream of milk is not only an agreeable aliment when recent, but alſo uſeful in medicine as a lenient, when applied to tetters and eryſipelas attended with pain and proceeding from an acrid humour.

Cream of Tartar, the trivial name of the ſupertartrate or the acidulous tartrate of potaſh. It is alſo denominated *cryſtals* of *tartar*. In this ſalt there is an exceſs of the tartaric acid. See CHEMISTRY *Index*.

CREAT, in the manege, an uſher to a riding maſter; or a gentleman bred in the academy, with intent to make himſelf capable of teaching the art of riding the great horſe.

CREATION, in its primary import, ſeems to ſignify the bringing into being ſomething which did not before exiſt. The term is therefore moſt generally applied to the original production of the materials whereof the viſible world is compoſed. It is alſo, however, uſed in a ſecondary or ſubordinate ſenſe, to denote thoſe ſubſequent operations of the Deity upon the matter ſo produced, by which the whole ſyſtem of nature and all the primitive genera of things received their form, qualities, and laws.

There is no ſubject concerning which there have been more diſputes than this of creation. It is certain that none of the ancient philoſophers had the ſmalleſt idea of its being poſſible to produce a ſubſtance out of nothing, or that even the power of the Deity himſelf could work without any materials to work upon. Hence ſome of them, among whom was Ariſtotle, aſſerted that the world was eternal both as to its matter and form. Others, though they believed that the gods had given the world its form, yet imagined the materials whereof it is compoſed to have been eternal. Indeed the opinions of the ancients, who had not the benefit of revelation, were on this head ſo confuſed and contradictory, that nothing of any conſequence can be deduced from them. The freethinkers of our own and of former ages have denied the poſſibility of creation, as being a contradiction to reaſon; and of conſequence have taken the opportunity from thence to diſcredit revelation. On the other hand many defenders of the ſacred writings have aſſerted, that creation out of nothing, ſo far from being a contradiction to reaſon, is not only probable, but demonſtrably certain. Nay, ſome have gone ſo far as to ſay, that from the very inſpection of the viſible ſyſtem of nature, we are able to infer that it was once in a ſtate of non-exiſtence. It would be impoſſible for us, however, to enter into the multiplicity of arguments uſed on both ſides; nor can we pretend to ſettle it, as the ſubject is confeſſedly above human comprehenſion.

1
What works of creation God is known to have performed.

As to the works of creation which the Deity is known to us to have performed; all other beings, beſide himſelf, are his creatures. Men and other animals that inhabit the earth and the ſeas; all the immenſe varieties of herbs and plants of which the vegetable kingdom conſiſts; the globe of the earth, and the expanſe of the ocean; theſe we know to have been produced by his power. Beſides the terreſtrial world which we inhabit, we ſee many other material bodies diſpoſed around it in the wide extent of ſpace. The moon, which is in a particular manner connected with our earth, and even dependent upon it; the ſun, and the other planets with their ſatellites, which, like the earth, circulate round the ſun, and appear to derive from him life and heat; thoſe bodies which we call fixed ſtars, and conſider as illuminating and cheriſhing with heat each its peculiar ſyſtem of planets; and the comets which at certain periods ſurpriſe us with their appearance, and the nature of whoſe connection with the general ſyſtem of nature, or with any particular ſyſtem of planets, we cannot pretend to have fully diſcovered;—theſe are ſo many more of the Deity's works, from the contemplation of which we cannot but conceive the moſt awful ideas of his creative power.

Matter, however, whatever the varieties of form under which it is made to appear, the relative diſpoſition of its parts, or the motions communicated to it, is but an inferior part of the works of creation. We believe ourſelves to be animated with a much higher principle than brute matter; in viewing the manners and economy of the lower animals, we can ſcarcely avoid acknowledging even them to conſiſt of ſomething more than various modifications of matter and motion. The other planetary bodies which ſeem to be in circumſtances nearly analogous to thoſe of the earth, are ſurely, as well as it, deſtined for the habitations of rational, intelligent beings. The exiſtence of intelligences of a higher order than man, though infinitely below the Deity, appears extremely probable.—Of thoſe ſpiritual beings called Angels we have expreſs intimation in Scripture; (ſee the article ANGELS.) Such are our notions concerning the exiſtence of beings eſſentially diſtinct from matter, and in their nature far ſuperior to it; theſe, too, muſt be the creatures of the Deity, and of his works of creation the nobleſt part. But the limits of creation we muſt not pretend to define. How far the regions of ſpace extend, or how they are filled, we know not. How the planetary worlds, the ſun and the fixed ſtars, are occupied, we do not pretend to have aſcertained. We are even ignorant how wide a diverſity of forms, what an infinity of living animated beings may inhabit our own globe. So confined is our knowledge of creation; yet ſo grand, ſo awful, that part which our narrow underſtandings can comprehend!

2
The periods of time at which God executed his works of creation

Concerning the periods of time at which the Deity executed his ſeveral works of creation, it cannot be pretended that mankind have had opportunities of receiving very particular information. From viewing the phenomena of nature, and conſidering the general laws by which they are regulated, we cannot draw any concluſive or even plauſible inference with reſpect to the preciſe period at which the univerſe muſt have begun to exiſt. We know not, nor can we hope to aſcertain, whether the different ſyſtems of planets circulating round our ſun and the other fixed ſtars, were all created at one period, or each at a different period. We cannot even determine, from any thing that appears on the face of nature, whether our earth was not created at a later period than any of her fellow planets which revolve round the ſame ſun. Aſtronomers are, from time to time, making new diſcoveries in the heavens; and it is impoſſible to ſay whether ſome of theſe ſucceſſive diſcoveries may not be owing to ſucceſſive creations.

Philoſophers have, indeed, formed ſome curious conjectures concerning the antiquity of the earth, from the appearances of its ſurface, and from the nature and diſpoſition of its interior ſtrata. The beds of lava in the neighbourhood of volcanoes have afforded ground for ſome calculations, which, though they do not fix the period of the earth's origin, are yet thought to prove that period to have been much more remote than the earlieſt age of ſacred or profane hiſtory. * In the neighbourhood of Mount Ætna, or on the ſides of that extenſive mountain, there are beds of lava covered with a conſiderable thickneſs of earth; and at leaſt another, again, which though known from ancient monuments and hiſtorical records to have iſſued from the volcano at leaſt 2000 years ago, is ſtill almoſt entirely deſtitute of ſoil and vegetation: in one place a pit has been cut through ſeven different ſtrata of lava; and theſe have been found ſeparated from each other by almoſt as many thick beds of rich earth. Now, from the fact, that a ſtratum of lava 2000 years old is yet ſcantily covered with earth, it has been inferred by the ingenious canon Recupero, who has laboured 30 years on the natural hiſtory of Mount Ætna, that the loweſt of theſe ſtrata which have been found divided by ſo many beds of earth, muſt have been emitted from the volcanic crater at leaſt 14,000 years ago; and conſequently that the age of the earth, whatever it may exceed this term of years, cannot poſſibly be leſs. Other facts of a ſimilar nature likewiſe concur to juſtify this conjecture.

But all theſe facts are as nothing in compariſon with the long ſeries which would be requiſite to eſtabliſh ſuch a conjecture as an incontrovertible truth. And beſides, any evidence which they can be ſuppoſed to afford, may be very eaſily explained away. The bed of lava which in the courſe of 2000 years has ſcarce acquired a covering of earth, is confeſſed to ſtand in a ſituation in which it is expoſed to the ſpray of the ſea, and to all the violence of winds and rains. In ſuch a ſituation, it cannot be thought that a thick bed of earth could, in any length of time, be formed on it: we might as well expect depth of ſoil and vigorous vegetation on the craggy cliffs of hills. In crevices here and there over it, in which the earth has been retained, there is a depth of ſoil which ſupports large trees. This fact, therefore, admits of no ſuch inference as that which Recupero has pretended to deduce from it. The local circumſtances, again, of the ſeven ſtrata that have been pierced through, are very different. They are ſituated at Jaci Reale, in a ſituation where ſhowers of aſhes from the volcano muſt frequently fall; and where whatever falls muſt be naturally retained and accumulated:—ſo that ſeven beds of earth might be formed on theſe ſeven ſtrata of lava much ſooner than one thin layer could be formed on the ſtratum above mentioned. In other places, ſome of which are within the influence of the ſame awful volcano, and ſome adjacent to that of Veſuvius, ſoil is known to have accumulated on lava with the help of ſhowers of aſhes from the volcanoes, with ſufficient rapidity to juſtify this ſuppoſition concerning the coverings of the ſtrata at Jaci Reale. From the obſervation of theſe phenomena of volcanoes, therefore, no facts have been gained that can help us to determine with any certainty the earth's age. And ſo wide is the variety of circumſtances to be here taken into account, that it cannot be hoped that this *deſideratum* will be ever ſupplied from this quarter. See further the article EARTH.

But by examining the compoſition and arrangement of the interior ſtrata of the globe, and by viewing the general appearance of its ſurface, the ingenuity of philoſophers has, with better hopes, ſought to gueſs at the length of time during which it muſt have exiſted. Obſerving the exuviæ of ſea and land animals depoſited at profound depths under ground, and accompanied with vegetable bodies in a good ſtate of preſervation, as well as with oleaginous and bituminous ſubſtances which have in all probability been formed from vegetable bodies; and remarking at the ſame time with what confuſion the other materials, compoſing the cruſt of this terreſtrial ball, are, in various inſtances, not arranged, but caſt together; they have concluded that the earth muſt have exiſted for many an age before the earlieſt events recorded in ſacred or profane hiſtory, and muſt have undergone many a revolution, before it ſettled in its preſent ſtate. Such at leaſt are the ideas which Buffon and M. de Luc, and alſo Dr Hutton †, ſeem deſirous to impreſs us with concerning its changes and antiquity.—It will be only doing juſtice to theſe philoſophers to acknowledge, that they have collected, with amazing induſtry, almoſt every fact in the natural hiſtory of the earth that can ſerve to give plauſibility to their conjectures. But ſtill their facts, beſides the inconſiſtency of many of them, are by far too ſcanty to warrant the concluſions which they have deduced from them. See the article Earth.

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* *Brydone's Tour through Sicily and Malta.*

† *Ed. Phil. Tranſ.* vol. i.

3
Accounts of the antiquity of the earth from profane hiſtory.

The voice of profane hiſtory is far from being deciſive concerning the age of the world; nor is it to be expected that it ſhould. When the earth firſt aroſe into exiſtence, we can be at no loſs to conceive that mankind were not ſpectators of the event; and we may naturally imagine that the firſt human beings who occupied it, would be too much buſied in furniſhing themſelves with the immediate neceſſaries and the conveniences of life, to think of curious reſearches into its origin, or even their own. Profane hiſtory is not, however, without accounts of the age of the earth and the origin of human ſociety; but thoſe accounts are various and contradictory.—Plato in his dialogue entitled *Critias*, mentions his celebrated Atalantis to have been buried in the ocean about 9000 years before the age in which he wrote. He aſſerts it to have been well known to the Egyptian prieſts and to the contemporary inhabitants of Attica. The learned world, indeed, generally agree in regarding his accounts of that iſland as a fiction, which the author himſelf did not deſign to be underſtood in any other light: ſome, however, are more credulous, and others go ſo far as to acknowledge doubts: and, if the exiſtence of ſuch an iſland, at a period ſo diſtant, be admitted as a fact worthy of any credit, the age of the world may be reckoned as at leaſt conſiderably more than 12,000 years. The pretenſions of the Chineſe repreſent the world as ſome hundreds of thouſands of years older: and we are alſo told * that the aſtronomical records of the ancient Chaldeans carried back the origin of ſociety to a very remote period; no leſs than 473,000 years. The Egyptian prieſts reckoned between Menes and Sethon 341 generations †. But theſe accounts are ſo diſcordant, and ſo ſlenderly ſupported by evidence, that we cannot heſitate to reject them all as falſe; the fables of hiſtorians ſcarce merit ſo much attention as the hypotheſes of philoſophers.

4
The era of the creation as ſtated in ſacred hiſtory.

When from profane we turn to ſacred hiſtory, we may reaſonably expect more accurate and more credible information concerning the antiquity of the globe. As the authenticity of the Holy Scriptures is ſo incontrovertibly eſtabliſhed, wherever they afford evidence concerning any fact, that evidence muſt be regarded as deciſive. A fact ſo important as the preſent may be thought highly worthy of a place in them. Unfortunately, however, even the ſacred writings do not fix the era of the creation with ſufficient accuracy; they leave us, in ſome meaſure, at a loſs whether to extend what they ſay concerning that era to the whole contents of created ſpace, or to confine it to our earth and its inhabitants: different copies give different dates; and even in the ſame copy, different parts relating the ſame events, either diſagree or do not ſpeak deciſively with regard to the length of the time in which they paſſed.—In the beginning of the ſixth chapter of the firſt book of Kings, the time which elapſed between the departure of the children of Iſrael from Egypt, and the period at which Solomon laid the foundation of his temple, is ſaid to have been 480 years: And in the book of Judges again, the age of all the patriarchs amounts to 592 years ‡. The Hebrew copy of the Bible, which we Chriſtians for good reaſons conſider as the moſt authentic, dates the creation of the world 3044 years before the Chriſtian era. The Samaritan Bible, again, fixes the era of the creation 4305 years before the birth of Chriſt. And the Greek tranſlation, known by the name of the *Septuagint* verſion of the Bible, gives 5270 as the number of the years which intervened between theſe two periods. As many other different calculations of the years contained in the ſame intermediate ſpace of time, might be formed upon other dates in the ſacred volume, differing in the different copies. By comparing the various dates in the ſacred writings, examining how theſe have come to diſagree and to be diverſified in different copies, endeavouring to reconcile the moſt authentic profane with ſacred chronology, and eking out deficiency of dates and evidence with conjecture; ſome ingenious men have formed ſchemes of chronology, plauſible indeed, but not ſupported by ſufficient authorities, which they would gladly perſuade us to receive in preference to any of thoſe above mentioned. Uſher makes out from the Hebrew Bible 4004 years, as the term between the creation and the birth of Chriſt: Joſephus, according to Dr Wills and Mr Whiſton, makes it 4658 years; and M. Pezron, with the help of the Septuagint, extends it to 5872 years. Uſher's ſyſtem is the moſt generally received.

But though theſe different ſyſtems of chronology are ſo inconſiſtent and ſo ſlenderly ſupported, yet the differences among them are ſo inconſiderable in compariſon with thoſe which ariſe before us when we contemplate the chronology of the Chineſe, the Chaldeans, and the Egyptians, and they agree ſo well with the general information of authentic hiſtory and with the appearances of nature and of ſociety, that they may be conſidered as nearly fixing the true period of the creation of the earth.

5
No information on this head to be obtained from any other ſource but ſacred hiſtory.

Profane hiſtory cannot be expected to contain an account of the firſt events which paſſed after the creation of the ſubſtances of which the univerſe conſiſts. The conjectures of ancient philoſophers on this ſubject cannot merit attention; for vague tradition, and the appearances of nature, the only data on which they could proceed in forming their conjectures, could admit of no fair inductions concerning thoſe events; and beſides, inſtead of liſtening to tradition, or examining the appearances of nature, they generally conſulted imagination, and imagination alone, on ſuch occaſions. Here, therefore, we have nothing to hope but from the ſacred writings. From them we may expect hiſtorical information, not to be obtained from any other ſource. What they communicate is communicated on divine authority; and it is only on ſuch authority we can receive any accounts concerning the creation.

6
Hints concerning the creation in the book of Job.

A few hints in the book of Job afford the earlieſt information to be found in the ſcriptures concerning the creation of the world. "Where waſt thou when I laid the foundations of the earth, when the morning ſtars ſang together, and all the ſons of God ſhouted for joy *." "Behold, he put no truſt in his ſervants, and his angels he charged with folly *." "And unto man (or to Adam), he ſaid, Behold, the fear of the Lord is wiſdom, and to depart from evil is underſtanding †." Theſe paſſages rather hint at than relate facts. But it has been inferred from them, that there were ſtars in the firmament, and angels in heaven, before the formation of our globe; that angels as well as man have fallen; and that other injunctions, beſides that of abſtaining from the forbidden fruit, were laid on Adam when he was firſt placed in Paradiſe ‡. If the interpretation be admitted as juſt, the firſt of theſe facts may be conſidered as forming, as it were, a point with which our knowledge of the works of the Deity commences: the period of time at which the ſecond event took place is not ſpecified: and the precept to Adam muſt no doubt have been uttered after he was formed and inſpired with intelligence. Yet with regard to the firſt of the above quotations from the book of Job, the only one that is of importance to us at preſent, it muſt be acknowledged, that it has been differently underſtood. The morning ſtars might ſing together, and the ſons of God ſhout for joy, on account both of their own creation and of the creation of the earth at one time; and yet Job, having been himſelf made a conſcious being at a much later period, not be able to tell where he was at that era of exulting gratitude and congratulation.

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* Univerſal Hiſt. vol. i. Preface.

† Herod. l. ii. c. 142.

‡ Univerſal Hiſt. vol. i. Preface.

* Chap. xxxviii. ver. 4. & 7.

7
Moſaic account of the creation.

Moſes relates, that || "in the beginning God created the heavens and the earth. And the earth (continues he) was without form and void; and darkneſs was upon the face of the deep: and the ſpirit of God moved upon the face of the waters. And God ſaid, Let there be light; and there was light. And God ſaw the light, that it was good: and God divided the light from the darkneſs. And God called the light day, and the darkneſs he called night: and the evening and the morning were the firſt day." During five ſucceeding days the work of creation was carried on. On the ſecond day, a firmament was made to ſeparate the waters, and that firmament called *heaven*: on the third day, the waters were collected into ſeas, and the land from which the waters retired cauſed to produce graſs and trees and other plants: on the fourth day, lights were made to appear in the firmament; to enlighten the earth, to divide the day from the night, and to diſtinguiſh time into ſeaſons and years: on the fifth day, the ſeas were peopled with whales and other fiſhes, and the air with fowls: on the ſixth day, the earth was furniſhed with reptiles and quadrupeds of all kinds; and on the ſame day, the firſt human pair, the progenitors of all the human race, were created in God's own image.

8
Difficulties occurring in the above account.

Some difficulties occur in comparing this account of the creation with the laws which appear at preſent to regulate the ſyſtem of nature. We find it hard to conceive how the earth, while yet a ſtranger to the influence of the ſun, could experience the viciſſitude of day and night; and are aſtoniſhed at the rapidity with which trees and herbage firſt overſpread its ſurface. The condition of matter when the earth was without form and void, and the operation of the ſpirit of God on the face of the waters, are equally myſterious.

9
Attempts to ſolve thoſe difficulties. Dr Burnet's theory.

Some ingenious men have eagerly laboured to remove theſe difficulties. Among theſe is Dr Burnet, whoſe theory of the earth has now been long conſidered as fanciful and ill-founded. He ſuppoſes all the celeſtial bodies, even the ſun and all the other planets of the ſolar ſyſtem, to have exiſted long before the earth. The chaos on which the ſpirit of God moved, conſiſted, according to him, of the firſt principles from which all terreſtrial bodies have been formed. When thoſe laws by which the material world is regulated firſt began to operate on the maſs, he ſuppoſes that its groſſer and heavier parts would ſink towards the centre, and there form a ſolid ball. Around this ſolid ball two ſpecies of particles would ſtill float together in confuſion. Of theſe he thinks one, being more volatile, would by degrees make its eſcape from the other. would leave it ſtill recumbent on the ſolid centre, and ſpread around it in an atmoſphere. The middle ſtratum he compoſes of aqueous and oleaginous fluids; and he makes no doubt, that after the air had made its eſcape, the levity of the oleaginous fluids would enable them to riſe above the aqueous, and diſpoſe themſelves next the ſurface of the liquid maſs. On them he ſuppoſes the impure atmoſphere to have then depoſited a quantity of terrene particles, ſufficient to form, by intermixture with the oils, a thick cruſt of rich earth for the production of plants and herbage, and to afford an habitation to animals. This delicate ſhell he was careful not to furrow with ſeas or load with mountains: either of theſe would have reduced all to confuſion. Such is his earth; and after moulding it with ſo much ingenuity, and into ſo happy a form, he contents himſelf, without venturing to uſe the ſame freedoms with the remaining part of Moſes's account of the creation.

10
Objections to Dr Burnet's theory.

But Moſes affords nothing that can be with any propriety uſed in the foundation of ſuch a theory: he tells not whether the chaos conſiſted of thoſe terrene, and aqueous, and oleaginous, and aerial particles which Dr Burnet finds in it; he confines not the ſeas within a cruſt of earth; nor does he inform us that the ſcenery of nature was not diverſified by hills and vales. Beſides, the author of this theory has, without any evidence, ſuppoſed matter to have been originally under the influence of laws very different from thoſe by which it is at preſent regulated. Oil, indeed, while fluid, floats above water: but in a concrete ſtate, it ſinks in water like other ſolid bodies. If reduced into that ſtate by combination with terrene matters, ſufficient to render the mixture proper for the nouriſhment and production of vegetables, its ſpecific gravity will be ſtill greater, and it will conſequently ſink ſo much the ſooner. How a concrete ſubſtance, conſiſting of earth and oil, could float on water, appears an inexplicable enigma. But we need not here take farther pains in combating and triumphing over this theory, which has long ſince fallen and ſunk to its grave.

11
Mr Whiſton's theory.

Mr Whiſton treats both the ſcriptures and the laws of nature with greater reverence. Yet he certainly involves himſelf in no trifling difficulties in attempting to ſolve thoſe which Moſes preſents. He ſuppoſes the ſun, moon, and ſtars, to be all more ancient than the earth. The chaos from which the earth was formed he repreſents as having been originally the atmoſphere of a comet. The ſix days of the creation he would perſuade us to believe equal to ſix of our years:

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* Chap. iv. ver. 18.

† Ch. xxviii. ver. 28.

‡ *Milne's Lectures*, Lect. I.

|| Gen. i. 1.

years: for he is of opinion, that the earth did not revolve daily round its axis, but only annually round its orbit, till after the fall of man.

On the firſt day or year, therefore, the more ponderous parts of the chaos were, according to this theory, conglomerated into an orb of earth, the chinks and interſtices over that orb filled up with water, and the exterior part or atmoſphere rarefied, ſo as to admit ſome faint glimmering of the rays of the ſun.

On the ſecond day, the atmoſphere was diffuſed to its due extent around the earth, and reduced to a degree of rarity and purity which rendered it ſtill more ſuitable for the tranſmiſſion of light; the earth was ſtill more conſolidated; and the waters being almoſt entirely excluded from the interſtices which they before occupied, were partly ſpread over the ſurface of the earth, and partly raiſed in vapour into the atmoſphere or firmament.

On the third day, the earth's ſurface became ſo irregular, in one place riſing into hills, in another ſinking into vales, as to cauſe the waters, which were before equally diffuſed, to collect into ſeas and lakes, leaving large tracts of ground unoccupied. And no ſooner was a part of the earth's ſurface left bare by the waters, than the general influence of the ſun produced on it a rich covering of herbage, and all the different ſpecies of vegetables.

On the fourth day, the earth was rendered ſubject to the regular influence of the ſun, moon, and ſtars.

On the fifth day or year, things were ſo far advanced, that fiſhes and fowls were now produced from the waters.

On the ſixth day was the earth furniſhed with animals; and the lord of all the other animals, man, was now created.

12 Objections to Mr Whiſton's theory.

Such is Mr Whiſton's account of the phenomena of the Moſaic creation. But he likewiſe aſſumes much more than can be reaſonably granted. The atmoſphere of a comet could not well be the primitive chaos: it is not an obſcure, but a pellucid fluid; and its exterior ſtrata, if of the ſame nature with the matter of our earth, muſt be ſcorified by its near approaches to the ſun. Had the earth not begun to move round its axis till after the work of creation was completed, the immoderate degrees of heat and cold which its different parts would have alternately felt, would in all probability have proved fatal to both plants and animals. Even the moſt artful interpretation of Moſes's words cannot repreſent him as meaning to inform us that the ſun and moon were created at different periods. But philoſophy will ſcarce permit us to imagine that the moon was formed before the earth. And therefore we cannot upon good grounds agree with Mr Whiſton, that the creation of the earth was later than that of the other bodies of the ſolar ſyſtem.

13 M. de Luc's theory and objections.

Among others who have endeavoured to explain the original formation of the earth, and the changes which it has undergone, is M. de Luc. This coſmologiſt, like Mr Whiſton, thinks that the days of the creation were much longer periods of time than our preſent days. He ſeems to think that the earth had exiſted long before the Moſaic creation; but began at that era to experience new changes, and to be regulated by new laws: that all the different events deſcribed by Moſes in his hiſtory of the creation, actually took place in the order in which he relates them; but that Moſes's days are indefinite ſpaces of time, which muſt have been very long, but of which we cannot hope to aſcertain the preciſe length. Theſe are ingenious conjectures; but they do not appear neceſſary, nor are they juſtified by facts. For a fuller and more cloſe inveſtigation of this part of the ſubject, we muſt refer to the article EARTH: and ſhall now cloſe the preſent article with a ſhort explanation of what appears to us the moſt natural way of underſtanding Moſes's account of the creation.

It has been conjectured *, with great probability, that the creation of which Moſes is the hiſtorian, was neither confined to the earth alone, nor extended to the whole univerſe. The relation which all the planets of the ſolar ſyſtem bear to the ſame illuminating body countenances the conjecture, that they, together with the luminary by which they are enlightened, were all created at one period: but it would perhaps be to conceive too meanly of the benevolence, wiſdom, and active power of the Deity, to ſuppoſe that before that period theſe had never been exerted in any work of creation. Yet even here we have not demonſtrative evidence.

On the ſuppoſition that the whole ſolar ſyſtem was created at once, which has at leaſt the merit of doing no violence to the narrative of Moſes, the creation of the ſun and the other planets may be underſtood to have been carried on at the ſame time with the creation of the earth. In that caſe, even in the courſe of the firſt day, though not longer than our preſent days, thoſe bodies might be reduced to ſuch order, and their relative motions ſo far eſtabliſhed, as to begin the diſtinction between light and darkneſs, day and night.

On the ſecond day, we may naturally underſtand from Moſes's narrative, that the atmoſphere was purified, and the ſpecific gravities of aqueous vapour and atmoſpheric air ſo adjuſted, as to render the latter capable of ſupporting the former.

On the third day the waters were firſt collected into lakes and ſeas: but in what manner, we cannot well determine. Some call in the operation of earthquakes; others tell us, that when the earth was firſt formed, the exterior ſtrata, were, at different parts over its ſurface, of different ſpecific gravities; and that the more ponderous parts now ſunk nearer the common centre, while the lighter parts ſtill remaining equally remote from it as before, formed iſlands, continents, hills, and mountains. But theſe are mere fancies; and we have no facts to offer in their ſtead. On the latter part of this day vegetables were cauſed to ſpring up over the earth. Their growth muſt have been much more rapid than we ever behold it now: but by what particular act of ſupernatural power that might be effected, we ſhould in vain inquire.

On the fourth day the ſun, moon and ſtars, were made to appear. But according to the conjecture which we have mentioned, as plauſible, though without aſcribing to it the evidence of certain truth, thoſe heavenly bodies are to be conſidered as having been created before this day. But they might now begin to exert their full influence on the earth in the ſame manner as they have ſince continued to do.

The creation of the inanimate world was now finiſhed,

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* *Univerſal Hiſt.* vol 1. p. 55.

niſhed, and the earth prepared for the reception of animals. On the fifth day, therefore, were the living inhabitants of the air and the waters created.

On the ſixth day the inferior animals inhabiting the earth were firſt created; and after that, the whole work was crowned by the creation of a male and female of the human ſpecies. To the account of the creation of the animals, nothing certain can be added in explanation of Moſes's narrative. No more but one pair of the human ſpecies were at firſt created: the ſame economy might poſſibly be obſerved in the creation of the inferior animals.

CREBILLON, Prosper Joliot de, a French writer of tragedy, and uſually ranked after Corneille and Racine, was born at Dijon in 1674. He was originally deſtined to the profeſſion of the law, and placed at Paris with that view; but the impetuoſity of his paſſions rendering him unfit for buſineſs, he was urged by ſome friends, who diſcerned very well his natural turn, to attempt dramatic compoſitions. He complied, but not till after many refuſals; and gave at length a tragedy, which met with great ſucceſs. He then marched on in the career he had begun, but was checked by a fit of love for an apothecary's daughter: which fit of love ended in marriage. His father, doubly enraged at his ſon for thus ſurrendering himſelf to the two demons of Love and Poetry, diſinherited him; but falling ſick ſome years after, in 1707, he re-eſtabliſhed him in all his rights, and died. Crebillon was, however, little better for his acquiſitions, the greateſt part being probably waſted before they came; and thus, though high in fame and at the prime of life, he ſtill continued poor. He loſt his wife in 1711, and fortune long frowned upon him, till at laſt he obtained a place in the French academy, and the employment of cenſor of the police. He was afterwards in more proſperous circumſtances, which continued to the end of a long life. He died in 1762, at the age of 88, much regretted on account of his numerous virtues. He was of a temperament extremely robuſt, without which he could not have held out ſo long; for he ate prodigiouſly, and continued to the laſt ſo to do. He ſlept little, and lay as hard as if upon the floor; not from any pious principle of mortifying, but becauſe he liked it. He was always ſurrounded with about 30 dogs and cats; and uſed to ſmoke a good deal of tobacco, to keep his room ſweet againſt their exhalations. Whenever he was ill, he uſed to manage himſelf according to his own fancy and feelings; for he made a jeſt of phyſic and phyſicians. He was a dealer in *bons mots*. Being aſked one day in full company, which of his works he thought the beſt? "I don't know (ſays he) which is my beſt production; but this (pointing to his ſon) is certainly my worſt."

CRECY, Crescy, or Cressy. See Cressy.

CREDENTIALS, letters of recommendation and power, eſpecially ſuch as are given to ambaſſadors or public miniſters, by the prince or ſtate that ſends them to foreign courts.

CREDIBILITY, a ſpecies of evidence, leſs indeed than abſolute certainty or demonſtration, but greater than mere poſſibility; it is nearly allied to probability, and ſeems to be a mean between poſſibility and demonſtration.

CREDIT, in *Commerce*, a mutual truſt or loan of merchandiſe or money, on the reputation of the probity and ſolvability of a dealer.

Credit is either public or private. Every trader ought to have ſome eſtate, ſtock, or portion of his own, ſufficient to carry on the traffic he is engaged in: they ſhould alſo keep their dealings within the extent of their capital, ſo that no diſappointment in their returns may incapacitate them from ſupporting their credit. Yet traders of worth and judgment may ſometimes lie under the neceſſity of borrowing money for carrying on their buſineſs to the beſt advantage; but then the borrower ought to be ſo juſt to his own reputation, and to his creditors, as to be well aſſured that he has ſufficient effects within his power to pay off his obligations in due time. But if a trader ſhould borrow money to the extent of his credit, and launch out into trade ſo as to employ it with the ſame freedom as if it was his own proper ſtock, ſuch a way of management is very precarious, and may be attended with dangerous conſequences. Merchants ought never to purchaſe their goods for exportation upon long credit, with intent to diſcharge the debt by the return of the ſame goods; for this has an injurious influence on trade ſeveral ways: and if any merchant has occaſion to make uſe of his credit, it ſhould always be for the borrowing of money, but never for the buying of goods; nor is the large credit given to wholeſale traders a prudential or juſtifiable practice in trade.

The public credit of a nation is ſaid to run high when the commodities of that nation find a ready vent, are ſold at a good price, and when dealers may be ſafely truſted with them: alſo when lands and houſes find ready purchaſers; when money is to be borrowed at a low intereſt; when people think it ſafe and advantageous to venture large ſtocks in trade; and when notes, mortgages, &c. will paſs for money.

Letters of Credit, are thoſe given to perſons in whom a merchant, &c. can truſt, to take money of his correſpondent abroad, in caſe he happens to need it.

Credit is alſo uſed for the currency which papers or bills have in the public or among dealers. In this ſenſe credit is ſaid to riſe, when in negociating the ſhares of the company, they are received and ſold at prices above *par*, or the ſtandard of their firſt creation. Diſcredit is oppoſed to credit, and is uſed where money, bills, &c. fall below *par*.

Credit was alſo anciently a right which lords had over their vaſſals; conſiſting in this, that during a certain time they might oblige them to lend them money. In this ſenſe, the duke of Brittany had credit during fifteen days on his own ſubjects, and thoſe of the biſhop of Nantes; and the biſhop had the ſame credit or right among his ſubjects and thoſe of that prince.

CREDITON, a market town in Devonſhire, conſiderable for a good woollen manufactory: it is ſituated about 9 miles north-weſt of Exeter, in W. Long. 3. 50. and N. Lat. 50. 50.

CREDITOR, a perſon to whom any ſum of money is due, either by obligation, promiſe, or otherwiſe. See Debt.

CREDULITY denotes a weakneſs of mind, by reaſon of which a perſon yields his aſſent to propoſitions or facts, before he has conſidered their evidence.

CREECH, Thomas, eminent for his tranſlations of ancient authors both in proſe and verſe, was ſon of Thomas Creech, and born near Sherborne in Dorſetſhire in 1659. He was educated in grammar learning under Mr Carganven of Sherborne, to whom he afterwards dedicated a tranſlation of one of Theocritus's Idylliums: and entered a commoner of Wadham college in Oxford in 1675. Wood tells us that his father was a gentleman; but Giles Jacob ſays, in his Lives and Characters of Engliſh poets, that his parents circumſtances not being ſufficient to afford him a liberal education, his diſpoſition and capacity for learning raiſed him up a patron in Colonel Strangeways, whoſe generoſity ſupplied that defect. Be that as it will, Creech diſtinguiſhed himſelf much, and was accounted a good philoſopher and poet, and a diligent ſtudent. June 13. 1683, he took the degree of maſter of arts, and not long after was elected probationer fellow of All-ſouls college; to which, Jacob obſerves, the great reputation acquired by his tranſlation of Lucretius recommended him. Wood tells us, that upon this occaſion he gave ſingular proofs of his claſſical learning and philoſophy before his examiners. He alſo took the degree of B. D. on the 18th of March 1696. He now began to be well known by the works he publiſhed; but Father Niceron obſerves, that they were of no great advantage to his fortune, ſince his circumſtances were always indifferent. In 1699, having taken holy orders, he was preſented by his college to the living of Welwynn in Hertfordſhire; but this he had not long enjoyed before he put an end to his own life. The motives of this fatal cataſtrophe have been variouſly repreſented. The author of the *Nouvelles de la Republique des Lettres* informs us, that in the year 1700 Mr Creech fell in love with a woman who treated him with great neglect, though ſhe was complaiſant enough to ſeveral others. This affront he could not bear, and reſolved not to ſurvive it. Whereupon he ſhut himſelf up in his ſtudy, where he hanged himſelf about the end of June 1700, and was found in that ſituation three days after. The Poetical Regiſter ſays nothing of the particular manner of his death, but only that he unfortunately made away with himſelf in the year 1701; and aſcribes this fatal cataſtrophe of Mr Creech's life to the moroſeneſs of his temper, which made him leſs eſteemed than his great merit deſerved, and engaged him in frequent animoſities and diſputes upon that account. But from an original letter of Arthur Charlett, preſerved in the Bodleian library, it has lately been diſcovered, that this unhappy event was owing to a very different cauſe. There was a fellow collegian of whom Creech frequently borrowed money: but repeating his applications too often, he met one day with ſuch a cold reception, that he retired in a fit of gloomy diſguſt, and in three days was found hanging in his ſtudy. Creech's principal performances are, 1. A tranſlation of Lucretius. 2. A tranſlation of Horace; in which, however, he has omitted ſome few odes. 3. The Idylliums of Theocritus, with Rapin's Diſcourſe of Paſtorals. 4. A tranſlation of Manilius's Aſtronomicon. Beſides tranſlations of ſeveral parts of Virgil, Ovid, and Plutarch; printed in different collections.

CREED, a brief ſummary of the articles of a Chriſtian's belief.

The moſt ancient form of creeds is that which goes under the name of the apoſtolic creed: beſides this, there are ſeveral other ancient forms and ſcattered remains of creeds to be met with in the primitive records of the church. The firſt is the form of apoſtolical doctrine, collected by Origen; the ſecond is a fragment of a creed preſerved by Tertullian; the third remains of a creed is in the works of Cyprian; the fourth, a creed compoſed by Gregory Thaumaturgus, for the uſe of his own church; the fifth, the creed of Lucian the martyr; the ſixth, the creed of the apoſtolical conſtitutions. Beſides theſe ſcattered remains of the ancient creeds, there are extant ſome perfect forms, as thoſe of Jeruſalem, Cæſarea, Antioch, &c.

The moſt univerſal creeds are, the Apostolical, the Athanasian, and the Nicene creeds. See theſe articles.

Theſe three creeds are uſed in the public offices of the church of England; and ſubſcription to them is required of all the eſtabliſhed clergy. Subſcription to theſe was alſo required of the diſſenting teachers, by the toleration act; but from which they are now relieved by 19 Geo. III.

CREEK, a part of a haven, where any thing is landed from the ſea. So many landing places as there are in a harbour or port, ſo many creeks there are. It is alſo ſaid to be a ſhore or bank whereon the water beats, running in a ſmall channel from any part of the ſea; from the Latin *crepido*. This word is uſed in the ſtat. 4 Hen. IV. c. 20. and 5 Eliz. c. 5.

CREENGLES. See Cringle.

CREEPER. See Certhia, Ornithology *Index*.

Creeper, in naval affairs, an inſtrument of iron reſembling a grappling, having a *ſhank*, and four hooks or claws. It is uſed to throw into the bottom of any river or harbour, with a rope faſtened to it, to hook and draw up any thing from the bottom which may have been loſt. See Plate CL.

CRELLIUS, John, a famous Socinian, born in 1590, in a village near Noremberg. In 1612 he went into Poland, where the Unitarians had a ſchool, in which he became profeſſor of divinity, and miniſter at Crackow, where he died in 1632, aged 42. He was the author, 1. Of a famous Treatiſe againſt the Myſtery of the Trinity; 2. Commentaries on a part of the New Teſtament; and other works. All of them are ſcarce.

CREMA, a city and biſhop's ſee of Italy, capital of a diſtrict of the Milaneſe, called from it *Cremaſco*; it ſtands almoſt in the middle between Milan and Mantua, in E. Long. 10. 15. and N. Lat. 45. 20.

CREMASTER, in *Anatomy*, the name of a muſcle of the teſticle, of which there is one on each ſide. See Anatomy, *Table of the Muſcles*.

CREMATION is ſometimes uſed for burning, particularly when applied to the ancient cuſtom of burning the dead. This cuſtom is well known to have prevailed among moſt eaſtern nations, and continued with their deſcendants after they had peopled the different parts of Europe. Hence we find it prevailing in Greece, Italy, Gaul, Britain, Germany, Sweden, Norway, and Denmark, till Chriſtianity aboliſhed it.

CREMONA, in *Ancient Geography*, a Roman colony, with municipal rights, ſettled beyond the Po, below the confluence of the Addua, on the report of Hannibal's march into Italy (Polybius): a town at this day ſtill maintaining its name and flouriſhing ſtate. It was an opulent and mercantile city; but ſuffered greatly in the civil wars of Auguſtus (Virgil). In the war with Vitellius, it was deſtroyed by the partizans of Veſpaſian; but was ſoon after rebuilt by the munificence of the citizens and exhortations of Veſpaſian, (Tacitus). Now capital of the Cremoneſe, in the duchy of Milan. E. Long. 10. 30. N. Lat. 45.

CRENATED, a term uſed in botany. See BOTANY *Index*.

CRENELLE, or IMBATTLED, in *Heraldry*, is uſed when any honourable ordinary is drawn, like the battlements on a wall to defend men from the enemies ſhot. This attribute belongs to the arms of ſuch as have defended caſtles for their prince or country, or of ſuch as are ſkilled in architecture.

CRENOPHYLAX, in antiquity, a magiſtrate of Athens, who had the inſpection of fountains.

CREODIBA, in the cuſtoms of the middle age, a robbery and murder committed in a wood, where the body of the perſon killed was burnt in order to prevent any diſcovery of the crime. The word, ſays Wendelinus, is compounded of *cruy* and *diven*, that is, "wood-robbers."

CREOLES, a name originally given to the families deſcended from the Spaniards who firſt ſettled at Mexico in America. Theſe are much more numerous than the Spaniards properly ſo called, and the Mulattoes, which two other ſpecies of inhabitants they diſtinguiſh; and are excluded from all conſiderable employments. It is now uſed in a more extenſive ſenſe, and applied to all natives of the Weſt Indies.

CREON, king of Corinth, was ſon of Siſyphus. He promiſed his daughter Glauce to Jaſon, who had repudiated Medea. To revenge the ſucceſs of her rival, Medea ſent her for a preſent a gown covered with poiſon. Glauce put it on, and was ſeized with ſudden pains. Her body took fire, and ſhe expired in the greateſt torments. The houſe alſo was conſumed by the fire, and Creon and his family ſhared Glauce's fate.

CREON, ſon of Menœtius, was father to Jocaſta, the wife and mother of Oedipus. At the death of Laius, who had married Jocaſta, Creon aſcended the vacant throne of Thebes. As the ravages of the Sphynx were intolerable, Creon offered his crown and daughter in marriage to him who could explain the enigmas which the monſter propoſed. Oedipus was happy in his explanations, and he aſcended the throne of Thebes, and married Jocaſta without knowing that ſhe was his mother, and by her he had two ſons, Polynices and Eteocles. Theſe two ſons mutually agreed after their father's death to reign in the kingdom each a year alternately. Eteocles firſt aſcended the throne by right of ſeniority; but when he was once in power he refuſed to reſign at the appointed time, and his brother led againſt him an army of Argives to ſupport his right. The war was decided by a ſingle combat between the two brothers. They both killed one another, and Creon aſcended the throne till Leodamus the ſon of Eteocles ſhould be of ſufficient age to aſſume the reins of government. In his regal capacity he commanded that the Argives, and more particularly Polynices, who was the cauſe of all the bloodſhed, ſhould remain unburied. If this was in any manner diſobeyed, the offenders were to be buried alive. Antigone the ſiſter of Polynices tranſgreſſed, and was accordingly puniſhed. Hæmon the ſon of Creon, who was paſſionately fond of Antigone, killed himſelf on her grave, when his father refuſed to grant her pardon. Creon was afterwards killed by Theſeus, who had made war with him becauſe he refuſed burial to the Argives.

CREPANCE, in the manege, a chop or cratch in a horſe's leg, given by the ſpunges of the ſhoes of one of the hinder feet croſſing and ſtriking againſt the other hinder foot. This cratch degenerates into an ulcer.

CREPIDÆ, among the Romans, a kind of ſlippers or ſhoes, which were always worn with the *pallium*, as the *calcei* were with the *toga*.

CREPIS, HAWK-WEED, a genus of plants belonging to the ſyngeneſia claſs; and in the natural method ranking under the 49th order, *Compoſitæ*. See BOTANY *Index*.

CREPITATION, that noiſe which ſome ſalts make over the fire in calcination, called alſo *detonation*.

CREPITATION is alſo uſed in ſurgery, for the noiſe made by the ends or pieces of bones, when the ſurgeon moves a limb to aſſure himſelf by his ear of the exiſtence of a fracture.

CREPUNDIA, in antiquity, a term uſed to expreſs ſuch things as were expoſed along with children, as rings, jewels, &c. ſerving as tokens whereby they afterwards might be known.

CREPUSCULUM, in *Aſtronomy*, twilight; the time from the firſt dawn or appearance of the morning to the riſing of the ſun; and again, between the ſetting of the ſun and the laſt remains of day.

Papias derives the word from *creperus;* which, he ſays, anciently ſignified *uncertain*, *doubtful*, q. d. *a dubious light*. The crepuſculum is uſually computed to begin and end when the ſun is about 18 degrees below the horizon; for then the ſtars of the ſixth magnitude diſappear in the morning and appear in the evening. It is of longer duration in the ſolſtices than in the equinoxes, and longer in an oblique than in a right ſphere.

The crepuſcula are occaſioned by the ſun's rays refracted in our atmoſphere, and reflected from the particles thereof to the eye. See TWILIGHT.

CRESCENT, the new moon, which, as it begins to recede from the ſun, ſhows a little rim of light, terminating in points or horns, which are ſtill increaſing till it become full and round in the oppoſition. The word is formed from *creſco*, "I grow."

The term is alſo uſed for the ſame figure of the moon in its wane or decreaſe, but improperly; becauſe the points or horns are then turned towards the weſt, whereas they look to the eaſt in the juſt creſcent.

CRESCENT, in *Heraldry*, is a bearing in form of a half moon. The Ottomans bear ſinople, a creſcent montant, argent.

The creſcent is frequently uſed as a difference in coat armour, to diſtinguiſh it for that of a ſecond brother or junior family.

The figure of the creſcent is the Turkiſh ſymbol; or rather is that of the city Byzantium, which bore this device from all antiquity; as appears from medals ſtruck in honour of Auguſtus, Trajan, &c.

The creſcent is ſometimes montant, i. e. its points look towards the top of the chief, which is its moſt ordinary repreſentation; whence ſome contend, that the creſcent, abſolutely ſo called, implies that ſituation; though other authors blazon it montant, when the horns are towards the dexter ſide of the eſcutcheon, in which poſition others call it *incroiſſant*.

Creſcents are ſaid to be *adoſſed*, when their backs or thickeſt parts are turned towards each other; their points looking to the ſides of the ſhield. *Creſcent inverted*, is that whoſe points look towards the bottom; *turned creſcents* are placed like thoſe adoſſed; the difference is, that all their points look to the dexter ſide of the ſhield: *conturned creſcents*, on the contrary, look to the ſiniſter ſide: *affronted* or *appointed creſcents*, are contrary to the adoſſed, the points looking towards each other.

Crescent is alſo the name of a military order, inſtituted by Renatus of Anjou, king of Sicily, &c. in 1448; ſo called from the badge or ſymbol thereof, a creſcent of gold enamelled. What gave occaſion to this eſtabliſhment was, that Renatus took for his device a creſcent, with the word *loz*, " praiſe," which, in the ſtyle of rebus, makes *loz in creſcent*, q. d. *by advancing in virtue, one merits praiſe*.

CRESCENTIA, the calabash tree; a genus of plants belonging to the didynamia claſs; and in the natural method ranking under the 25th order, *Putamineæ*. See Botany *Index*.

The ſhells of calabaſhes are made uſe of for various purpoſes. At Barbadoes, beſides drinking-cups and punch bowls, there are made of them ſpoons, diſhes, and other utenſils for the ſlaves. Some of theſe ſhells are ſo large, as to be capable of holding 15 pints of water. The pulp is ſeldom eaten, except by cattle in the time of drought. The wood, which is hard and ſmooth, is made into ſtools, chairs, and other furniture.

CRESCIMBENI, John Maria, an Italian poet, was born at Macerata in Ancona, 1663. His talents for poetry and eloquence developed themſelves early. His verſes at firſt had too much pomp and point; but reſiding in Rome, and reading the beſt Italian poets, brought him back to nature. He not only reformed himſelf, but undertook to reform bad taſte in general. From this motive he projected the eſtabliſhment of a new academy, under the name of *Arcadia;* the members of which at firſt did not exceed 14, but afterwards increaſed much. They called themſelves the ſhepherds of Arcadia, and each took the name of ſome ſhepherd and ſome place in that ancient kingdom. The founder of this ſociety was appointed the director of it in 1690, and held this honourable poſt 38 years; namely, to the year of his death, which happened in 1728. Among a great number of works, in verſe and proſe, the principal is, A Hiſtory of the Italian Poetry, very much eſteemed, and reprinted, in 1731, at Venice, in ſix volumes 4to. This hiſtory is accompanied with a commentary, containing anecdotes of Italian poets. He publiſhed alſo A Hiſtory of the Academy of Arcadia, together with the Lives of the moſt illuſtrious Arcadians: and many other works.

CRESCY, or Cressy. See Cressy.

CRESS, water cress, or cresses. See Sisymbrium, Botany *Index*.

Indian Cress. See Tropæolum, Botany *Index*.

CRESSY, a port town of Picardy in France, about 44 miles ſouth of Calais, and 27 north-weſt of Abbeville, remarkable on account of the victory obtained there over the French by Edward III. of England, in the year 1346. E. Long. 2. 0. N. Lat. 50. 20.

Edward having encountered and overcome many difficulties in his expedition, was at laſt ſo cloſely followed and haraſſed by the French army, commanded by the king of France in perſon, that he determined to make a ſtand at this place, and to give his purſuers a check. For this purpoſe he choſe his ground with great judgment, on the gentle declivity of a hill, with a thick wood in his rear. He ordered deep entrenchments to be made on each flank, and waited with firmneſs the approach of his enemies. The king of France, dreading nothing ſo much as the eſcape of the Engliſh, began the march of his great army from Abbeville early in the morning, Auguſt 26. and continued it ſeveral hours with great eagerneſs, till he received intelligence that the Engliſh had halted at Creſſy, and were prepared to give him battle. He was adviſed at the ſame time not to engage that day, when his troops were much fatigued with their march, and in great diſorder; and he was diſpoſed to have taken this advice. But the diſcipline of theſe times was ſo imperfect, that the orders given for halting were not obeyed; and one corps of this mighty hoſt impelling another, they continued advancing till they came into the preſence of their enemies in much confuſion.

Edward had employed the forenoon of this important day in drawing up his army in the moſt excellent order, in three lines. The firſt line, which conſiſted of 800 men at arms, 4000 Engliſh archers, and 600 Welſh foot, was commanded by his young, amiable, and heroic ſon, the prince of Wales, aſſiſted by the earls of Warwick and Oxford, and ſeveral other noblemen. The ſecond line, compoſed of 800 men at arms, 4000 halbardiers, and 2400 archers, was led by the earls of Arundel and Northampton; the laſt line or body of reſerve, in which were 700 men at arms, 5300 billmen, and 6000 archers, was ranged along the ſummit of the hill, and conducted by the king in perſon, attended by the lords Moubray, Mortimer, and others. When the army was completely formed, Edward rode along the lines, and by his words and looks inſpired his troops with the moſt ardent courage and ſtrongeſt hopes of victory. He then commanded the cavalry to diſmount, and the whole army to ſit down upon the graſs, in their ranks, and refreſh themſelves with meat, drink, and reſt. As ſoon as the French army came in view, they ſprung from the ground, full of ſtrength and ſpirit, and ſtood ready to receive them.

The king of France, aſſiſted by the kings of Bohemia and Majorca, the dukes of Lorraine and Savoy, and ſeveral other ſovereign princes, with the flower of the French nobility, laboured to reſtore ſome degree of order to his prodigious army, and drew it up alſo in three lines, but very indiſtinctly formed. The firſt line was commanded in chief by the king of Bohemia; the ſecond by the earl of Alençon, the king of France's brother; and the third by Philip in perſon; and each of theſe lines contained a greater number of troops than the whole Engliſh army.

The battle of Creſſy was begun about three o'clock in the afternoon, Auguſt 26. by a great body of Genoeſe croſs-bowmen, in the French ſervice, who let fly their quarrels at too great a diſtance to do any execution, and were preſently routed by a ſhower of arrows from the Engliſh archers. The earl of Alençon, after trampling to death many of the flying Genoeſe, advanced to the charge, and made a furious attack on that corps commanded by the prince of Wales. The earls of Arundel and Northampton advanced with the ſecond line to ſuſtain the prince, and Alençon was ſupported by as many troops as could crowd to his aſſiſtance. Here the battle raged for ſome time with uncommon fury; and the earl of Warwick, anxious for the fate of the day and the ſafety of the prince, ſent a meſſenger to the king, intreating him to advance with the third line. Edward, who had taken his ſtand on a wind-mill on the top of the hill, from whence he had a full view of both armies, aſked the meſſenger, if his ſon was unhorſed, or wounded, or killed? and being anſwered, that the prince was unhurt, and performed prodigies of valour. "Go then," ſaid he, "and tell my ſon and his brave companions, that I will not deprive them of any part of the glory of their victory." This flattering meſſage being made known, inſpired the prince and his troops with redoubled ardour; and the king of Bohemia, the earl of Alençon, and many other great men, being ſlain, the whole firſt and ſecond lines of the French army were put to flight. Philip, undiſmayed at the ſlaughter of his troops, and the fall of ſo many princes, advanced to the charge with the line under his immediate command. But this body ſoon ſhared the ſame fate with the other two; and Philip, after having been unhorſed, and wounded in the neck and thigh, was carried off the field by John de Hainault, and fled with no more than five knights and about 60 ſoldiers in his company, of all his mighty army, which at the beginning of the battle conſiſted of more than 120,000 men. Such was the famous victory of Creſſy, the greateſt ever gained by any king of England. After the battle, the king flew into the arms of the prince of Wales, and graſping him to his boſom, cried in an ecſtaſy of joy, "My dear ſon, you have this day ſhowed yourſelf worthy of the knighthood which you lately received, and of the crown for which you have ſo bravely fought; perſevere in your honourable courſe." The prince, as modeſt as he was brave, ſunk down on his knees, his face covered with bluſhes, and begged his father's bleſſing. Edward continued with his army at Creſſy three days, employed in numbering and burying the dead. The French had left on this bloody ſcene the king of Bohemia, 11 other princes, 80 bannerets, 1200 knights, 1500 gentlemen, 4000 men at arms, and 30,000 other ſoldiers.

CREST, in armoury, denotes the uppermoſt part of an armoury; or that part riſing over the caſk or helmet. Next to the mantle, ſays Guillim, the creſt or cognizance claims the higheſt place; being ſeated on the moſt eminent part of the helmet; yet ſo as to admit an interpoſition of ſome eſcrol, wreath, chapeau, crown, &c.

The ancient warriors wore creſts to ſtrike terror in their enemies, as the ſight of the ſpoils of animals they had killed; or to give them the more formidable mien, by making them appear taller, &c.

In the ancient tournaments, the cavaliers had plumes of feathers, eſpecially thoſe of oſtriches and herons, for their creſts: theſe tufts they called *plumarts*; and were placed in tubes, on the tops of high caps or bonnets. Some had their creſts of leather; others of parchment, paſteboard, &c. painted or varniſhed, to keep out the weather; others of ſteel, wood, &c. on which were ſometimes repreſented a member or ordinary of the coat; as an eagle, fleur-de-lys, &c. but never any of thoſe called *honourable ordinaries*, as pale, feſſe, &c. The creſts were changeable at pleaſure; being reputed no other than as an arbitrary device or ornament.

Herodotus attributes the riſe of creſts to the Carians, who firſt bore feathers on their caſks, and painted figures on the bucklers; whence the Perſians called them *cocks*.

The creſt is eſteemed a greater mark of nobility than the armoury, as being borne at tournaments; to which none were admitted till they had given proof of their nobility. Sometimes it ſerves to diſtinguiſh the ſeveral branches of a family. It has alſo ſerved, on occaſion, as the diſtinguiſhing badge of factions. Sometimes the creſt is taken from the device; but more uſually it is formed of ſome piece of the arms: thus, the emperor's creſt is an eagle; that of Caſtile, a caſtle, &c. Families that exchange arms, as the houſes of Brunſwick and Cologne have done, do not change their creſts; the firſt ſtill retain the horſe, and the latter the mermaid.

CREST, in *Heraldry*, the figure placed above the helmet in an atchievement. See HERALDRY.

CREST-fallen, a fault of a horſe, when the upper part of his neck, called the *creſt*, hangs to one ſide: this they cure by placing it upright, clipping away the ſpare ſkin, and applying plaſters to keep it in a proper poſition.

CRETA, or CHALK, in *Natural Hiſtory*. See CHALK, MINERALOGY *Index*.

CRETE, one of the largeſt iſlands in the Mediterranean, lying between 22 and 27 degrees of eaſt longitude, and between 35 and 36 degrees of north latitude. According to Strabo, this iſland is 287 miles in length; and according to Pliny, 270; and according to Scylax, 312. As to its breadth, it is not, as Pliny obſerves, above 55 miles where wideſt; whence it was ſtyled, as Stephanus obſerves, the *Long iſland*. It has the Archipelago to the north, the African ſea to the ſouth, the Carpathian ſea to the eaſt, and the Ionian to the weſt. Anciently it was known by the names of *Aeria*, *Chthonia*, *Idea*, *Curete*, *Macaris*, &c. but its moſt common name was that of *Crete*.

The Cretan mythologiſts, quoted by Diodorus Siculus, relate that the firſt inhabitants of the iſland were the Dactyli Idæi, who dwelt around Mount Ida; they were regarded as magicians, becauſe they poſſeſſed a variety of knowledge, and were particularly ſkilled

led in religious myſteries. Orpheus, who diſtinguiſhed himſelf ſo highly in poetry and muſic, was their diſciple. They diſcovered the uſe of fire, iron, and braſs, and invented the art of working theſe metals in Berecynthius, a mountain near Aptera. Thoſe invaluable diſcoveries procured them divine honours. One of them, named Hercules, rendered himſelf famous by his courage and great exploits. He inſtituted the Olympic games; though poſterity, by a miſtake ariſing from his bearing the ſame name, have aſcribed that inſtitution to the ſon of Alcmena; who, indeed, trode in the ſteps of his predeceſſor, and raiſed himſelf alſo to immortality.

The Dactyli Idæi were the anceſtors of the Curetes. Theſe laſt at firſt inhabited the foreſts and caves of the mountains. Afterwards they entered into domeſtic life, and contributed, by their inſtitutions, to the civilization of mankind. They taught men to collect flocks of ſheep, to tame the ferocity of wild animals for domeſtic purpoſes, and to invite bees into hives, that they might rifle them of the fruit of their labours. They firſt prompted men to the chaſe, and taught the uſe of the bow. They were the inventors of ſwords and of military dances. The noiſe which they made, by dancing in armour, hindered Saturn from hearing the cries of Jupiter, whoſe education Rhea had entruſted to them. With the aſſiſtance of the nymphs, they brought up that god in a cave in Mount Ida, feeding him with the milk of the goat Amalthea, and with honey.

To this period mythology aſſigns the origin of the Titans; their abode near Gnoſſus, where ſtood the palace of Rhea; their travels over the whole earth; their war againſt Ammon, and his defence by Bacchus; the nuptials of Jupiter and Juno, celebrated nigh the river Therenus in Crete; the gods, goddeſſes, and heroes, who deſcended from them.

The moſt illuſtrious of thoſe heroes were Minos and Rhadamanthus. They are ſaid to have been the ſons of Jupiter and Europa, who was conveyed into the iſland on a bull. Minos becoming king, built ſeveral cities; the moſt conſiderable of which are—Gnoſſus, on that ſide of the iſland which faces Aſia, Phœſtus on the ſouthern ſhore, and Cydon on the weſtern, facing Peloponneſus. He gave to his ſubjects a code of admirable laws, which he pretended to have received from his father Jupiter in the grotto of Mount Ida.

Rhadamanthus diſtinguiſhed himſelf by the impartiality of his judgments, and by the inflexible ſeverity with which he inflicted puniſhment on the impious and wicked. His empire extended over the chief iſles of the Archipelago, and the inhabitants of the adjacent coaſts of Aſia ſubmitted to him on account of his high reputation for probity and juſtice. Mythologiſts have conſtituted him judge in the regions below, to determine the future ſtate of the righteous and the wicked. They have conferred on him the ſame honours which were beſtowed on Minos, the juſteſt of kings.

Thus far have been followed the Cretan traditions as they are related by Diodorus; but hiſtorians differ about the truth of them. There are a variety of opinions concerning the firſt inhabitants of Crete. Strabo, who has diſcuſſed them with great erudition, ſays, after ſeveral pages on the ſubject: “I am not fond of fables; yet I have detailed theſe at ſome length, becauſe they are connected with theology. Every diſcourſe concerning the gods ſhould examine the religious opinions of antiquity, and diſtinguiſh them from fable. The ancients were pleaſed to conceal their knowledge of nature under a veil. It is now impoſſible to unfold the meaning of their enigmas. But by expoſing to light the numerous allegories which they have left us, and by examining attentively their mutual relations and differences, genius may perhaps be able to unfold the truths which are couched under them.”

But leaving mythology for the more certain records and monuments of hiſtory, we find that Crete received its name from Crés, the firſt of its monarchs. He was author of ſeveral uſeful inventions, which contributed to the happineſs of his ſubjects. Prompted by gratitude, they endeavoured to perpetuate the memory of his favours, and to immortalize his name, by naming the iſland after him.

In order to diſtinguiſh the true Cretans from ſtrangers, they were named *Eteocretes*. A number of colonies, from different part of Greece, ſettled in the iſland. The agreeableneſs of the climate, and the fertility of the ſoil, invited them to fix their habitation there. The Lacedæmonians, Argives, and Athenians, were the principal people who ſent colonies into Crete. This is what makes Homer ſay, “Crete is an extenſive iſland in the midſt of the ſtormy main. The ſoil is rich and fertile. It contains an immenſe number of inhabitants. It is adorned with a hundred cities. Its inhabitants ſpeak in various languages. We find there Achæans, valiant Eteocretes, Cydonians, Dorians, and godlike Pelaſgians.” The Eteocretes inhabited the ſouthern diviſion of the iſland; they built there the city of Prœſus, and erected a temple to Dictæan Jove.

Crés was not the only monarch who reigned in the iſland of Crete. He had a ſeries of ſucceſſors. But hiſtory affords little information concerning them: only the names of a few of them are preſerved, and a ſmall number of events which happened under the reign of ſome others, but blended and diſfigured with an intermixture of fable. Among thoſe monarchs we find two Jupiters, and two of the name of Minos. However, moſt writers confound them, and aſcribe to one thoſe tranſactions and exploits which ſhould be ſhared between the two.

This remark chiefly regards Minos, who was eſteemed the wiſeſt legiſlator of antiquity. The office aſſigned him in the regions below is a clear and certain proof of his having gained an exalted reputation by his juſtice. Greece, ſays Plato, has with great propriety adopted the laws of Crete; for they are founded on the ſolid baſis of reaſon and equity, and have a natural tendency to render the people, who live in ſubjection to them, opulent and happy. One of thoſe laws forbade “the Cretans ever to carry their feſtivity ſo far as to intoxicate themſelves with wine.” The following was very ſuitable to repreſs the preſumptuous ardour of youth: “Let young people not canvaſs the laws with an indiſcreet curioſity; let them not examine whether the lawgiver has done right or wrong in promulgating them; but let them join unanimouſly in declaring them good, ſince they proceed from the gods. If any of the old men perceive ſomething in them meriting amendment, let him mention it to the magiſtrate, or diſcuſs it with his equals, but never in the preſence of the young people." That excellent code was engraven on tables of braſs: and Talos, chief miniſter to Minos, viſited all the towns and cities in the iſland, three times a-year, to obſerve in what manner the laws were executed and obeyed. The king of Crete, well knowing that the marvellous is neceſſary to command the belief and enforce the obedience of the people, pretended that he had received thoſe laws from his father Jupiter, in the grotto of Mount Ida. In the ſame manner, Lycurgus, before promulgating his laws, repaired to Delphos, and gave out they had received the ſanction of Apollo. A like reaſon induced Numa to pretend to an intimacy with the nymph Egeria, and Mahomet to aſcribe his doctrines and inſtitutions to the revelation of the angel Gabriel.

In contradiction to this account, others of the ancients deſcribe Minos as a prince impotently abandoned to the fury of his paſſions, and a barbarous conqueror. Falling paſſionately in love with the nymph Dictynna, who refuſed to gratify his wiſhes, he purſued her to the brink of the ſhore, and forced her to plunge into the ſea, where ſhe was ſaved by ſome fiſhermen, who received her in their nets. He was the firſt of the Greeks who appeared in the Mediterranean at the head of a naval armament. He conquered the Cyclades, expelled the Carians, eſtabliſhed Cretan colonies in thoſe iſlands, and committed the government of them to his ſon.

Being informed, while he was at Paros, that his ſon Androgeus was ſlain at Athens, he declared war againſt Egeus, and impoſed on him a diſgraceful tribute; from the payment of which Theſeus delivered his country. He took arms againſt Niſus, king of Megara, made him priſoner by the treachery of his daughter Scylla, and put him to death, together with Megarus, the ſon of Hippomanes, who had brought ſome forces to his aſſiſtance. Dædalus, who had by ſome means incurred his diſpleaſure, deſpairing of pardon from ſo ſevere and inflexible a prince, employed the reſources of his inventive genius, in order to eſcape from his power. He fled to Sicily, gained the protection of King Cocalus, and obtained an aſylum in his court. Valerius Flaccus has deſcribed his flight in a very lively and pictureſque manner. "Thus Dædalus, with the wings of a bird, aſcended from Mount Ida. Beſide him flew the comrade of his flight, with ſhorter wings. They appeared like a cloud riſing in the air. Minos, ſeeing his vengeance thus eluded, glowed with impotent rage. In vain he followed with his eyes the ſecure flight of his enemies through the wide expanſe of heaven. His guards returned to Gortynia with their quivers filled with arrows." The Cretan monarch did not, however, give up his prey. He equipped a fleet, purſued the fugitive to Sicily, and fell before the walls of Camicum.

It is plain, that thoſe actions cannot agree to the character of that juſt monarch, whoſe merits raiſed him to the office of determining, in the regions below, the unalterable fate of the righteous and the wicked. We may, therefore, reaſonably conclude, that Minos the legiſlator is a different perſon from the conqueror; that it was the former who gained a laſting reputation by his wiſdom and juſtice; and the latter who ſubdued moſt of the iſlands of the Archipelago, but being enſlaved by his paſſions, tarniſhed his glory by his cruelty and mercileſs thirſt for vengeance.

The laſt king of Crete was Idomeneus. This prince, accompanied by Merion, conducted 24 ſhips to the aſſiſtance of Agamemnon. Homer informs us of the illuſtrious exploits by which he ſignalized himſelf before the walls of Troy. At his departure, he committed the government of his kingdom to Leucus his adopted ſon, promiſing him the hand of his daughter Cliſithera if he governed wiſely in his abſence. That ambitious young man ſoon forgot the favours which had been ſo laviſhly beſtowed on him. Gaining a number of partiſans, he in a ſhort time aſpired to the immediate poſſeſſion of the crown. His impatience would not wait till he ſhould obtain it lawfully by marriage. Flattering himſelf, from the long abſence of the king, that he was perhaps fallen before Troy, he determined to mount the throne. Mida, wife to Idomeneus, and the princeſs Cliſithera, were an obſtacle to his wiſhes. But ambition knows no reſtraint, and tramples under foot the moſt ſacred obligations. The baſe wretch having ſeduced the people from their allegiance, and captivated the affections of the nobles, ſacrificed thoſe unfortunate victims in the temple. When Idomeneus, crowned with laurels, landed on the coaſt of Crete, Leucus, who had now firmly eſtabliſhed his power, attacked him with an armed force, and obliged him to reimbark. A different account is alſo given of the baniſhment of Idomeneus. Servius ſays that he had vowed, in a ſtorm, to ſacrifice to the the gods the firſt perſon that his eyes ſhould behold on the Cretan ſhore; that his ſon having met him firſt after his arrival, he fulfilled his vow, by ſacrificing him; and that the iſland, being ſoon after depopulated by peſtilence, the inhabitants looked upon that affliction as the effect of divine vengeance, and expelled the parricide; who, retiring to Italy, founded Salentum, on the Meſſapian coaſt, But that opinion appears entirely groundleſs. Hiſtory mentions no ſon of Idomeneus. If he had a ſon of his own blood, why did he adopt Leucus? Why did he intruſt to him the government of the iſland, when he promiſed him his daughter in marriage? The more probable opinion is, that the plague was introduced into the iſland by his ſhips, when he returned from the ſiege of Troy, as Herodotus aſſerts; and that Leucus artfully made uſe of that pretext to expel his lawful ſovereign from the iſland. But it appears that the uſurper did not long enjoy the fruit of his crimes. Soon after the departure of Idomeneus, monarchy was aboliſhed, and the government of Crete became republican.

The republic of Crete has been celebrated by the panegyric of Plato, ſerved Lycurgus as a model for that which he eſtabliſhed in Lacedemon, and was beheld by all Greece with reſpect and admiration. Strabo has thought it now unworthy of his pencil, and has conſecrated the leading features of its conſtitution to laſting fame in his immortal work. It was indeed a ſyſtem of legiſlature, whoſe direct tendency was to call forth the buds of virtue in the heart of infancy; to open and expand them in youth; to inſpire man, as he reached maturity, with the love of his country, of glory, and of liberty; and to comfort and ſupport the infirmities of age with the reſpect and eſteem due to the experience and wiſdom of that period of life. It laboured to form affectionate friends, patriotic citizens, and worthy magiſtrates. It made no uſe, however, of a multitude of acts and ſtatutes to produce thoſe ineſtimable advantages. They flowed all from one ſource: the public education of youth, judiciouſly directed. The virtuous examples ſet before youth in the courſe of that education, the illuſtrious deeds which were recited to them with high applauſe, the honours conferred on valour and on noble actions, the opprobrium invariably caſt on vice; theſe were the only means which the Cretan lawgiver made uſe of to form a warlike, humane, and virtuous nation.

The Cretan government, ſoon after the expulſion of Idomeneus, became ariſtocratical. The power was divided between the nobles and the people. Yet as the chief employments were occupied by the nobles, they directed the adminiſtration of affairs. Ten magiſtrates were annually elected, by a majority of voices, in the national aſſembly. Theſe were named *Coſmoi;* and their public office and character were the ſame with thoſe of the Ephori at Sparta. They were the generals of the republic in time of war, and directed all affairs of any importance. They had the right of chooſing certain old men for counſellors. Thoſe old men, to the number of twenty-eight, compoſed the Cretan ſenate. They were choſen from among ſuch as had diſcharged the office of Coſmoi, or had diſtinguiſhed themſelves by extraordinary merit and blameleſs probity. Thoſe ſenators continued in office during life, poſſeſſed a weighty influence, and were conſulted in every affair of any importance. This body was a barrier oppoſed by the wiſdom of the legiſlator againſt the ambition of the ten chief rulers. He had impoſed another reſtraint on their power, by limiting the period of their adminiſtration to one year. His foreſight went ſtill farther. The ſuffrages of the people might be obtained by bribery or perſonal influence, and of conſequence their choice might ſometimes fall on a man unworthy of ſo honourable an office. When that happened, he who had been undeſervedly advanced to the dignity of Coſmos was degraded, either in a national aſſembly, or ſimply by the voices of his colleagues. This, doubtleſs, is what Plato alludes to, when he ſays, "Neither the commonwealth, which approaches too near to a monarchical conſtitution, nor that which affects a licentious liberty, is founded on the ſolid baſis of a juſt medium between anarchy and deſpotiſm. O Cretans! O Lacedemonians! by eſtabliſhing yours on firmer foundations, you have avoided thoſe fatal extremes."

Such were the diſtribution of power and the adminiſtration of public affairs in the Cretan government. Its ſimplicity was admirable. A people who were bleſſed with the ſacred enjoyment of liberty, but poſſeſſed not ſufficient knowledge and diſcernment to direct themſelves, elected magiſtrates, to whom they delegated their authority. Thoſe magiſtrates, thus arrayed with ſovereign power, choſe ſenators to aſſiſt and direct their deliberations. Theſe counſellors could neither enact nor decide of themſelves; but they held their office for life; and that circumſtance contributed to ſtrengthen their influence and to increaſe their experience. The magiſtrates were animated by the moſt powerful motives to diſtinguiſh themſelves when in office, by unwearied activity in the public ſervice. On one ſide, they were reſtrained by the fear of degradation; on the other, actuated by the hope of becoming one day members of the national council.

Yet let us inquire what means the Cretan lawgiver uſed to form virtuous citizens. All the Cretans were ſubjected to the power of their magiſtrates; and divided into two claſſes, the adults and the youth. Men arrived at maturity were admitted into the firſt. The ſecond conſiſted of all the young men who were not below the age of ſeventeen. The ſociety of adults ate together in public halls. There rulers, magiſtrates, poor and rich, ſeated together, partook, without diſtinction, of the ſame ſimple fare. A large bowl, filled with wine and water, which went round the company from one to another, was the only drink that they were allowed. None but the old men had a right to call for more wine. Doubtleſs, that people, ſo celebrated for wiſdom, were not ſtrangers to the power of beauty; for a woman was appointed to preſide at each table. She openly diſtributed the moſt exquiſite meats to thoſe who had diſtinguiſhed themſelves by their valour or wiſdom. That judicious preference was ſo far from exciting envy or jealouſy, that it only prompted every perſon to deſerve it by brave and prudent conduct. Near where the citizens ſat, two tables were laid, which they named *Hoſpitable;* all ſtrangers and travellers were entertained at theſe; and there was alſo a particular houſe ſet apart by the public, in which they might ſpend the night.

To ſupply the public expences, every citizen was obliged to bring a tenth part of his annual income into the treaſury. The chief magiſtrates were to take care that every perſon contributed his proportion. In Crete, ſays Ariſtotle, one part of the fruits of the earth, of the produce of the flocks, of the revenues of the ſtate, and of the taxes and cuſtoms, is ſacred to the gods: the other is diſtributed among the members of the community; ſo that men, women, and children, all ſubſiſt at the public expence.

After dinner, the magiſtrates and ſenators uſually ſpent ſome time in deliberating on the affairs of the ſtate; they next recounted the noble deeds which had been done in war, celebrated the courage of their moſt diſtinguiſhed warriors, and animated the youth to heroic valour. Thoſe aſſemblies were the firſt ſchool of the youth. At the age of ſeven, the boy was permitted to handle the bow;—from that time he was admitted into the ſociety of the adults, where be continued till the age of ſeventeen. There, ſitting on the ground, and clothed in a plain and coarſe dreſs, he ſerved the old men, and liſtened, with reſpectful ſilence, to their advices. His young heart was inflamed with the recital of noble deeds in arms, and glowed with ardour to imitate them. He acquired habits of ſobriety and temperance. And being conſtantly witneſs of illuſtrious examples of moderation, wiſdom, and patriotiſm; the ſeeds of virtue were thus ſown and foſtered in his heart before he attained the uſe of reaſon.

He was early accuſtomed to arms and to fatigue, that he might learn to endure exceſſive heat or cold, to clamber and leap among hills and precipices, and to bear manfully the blows and wounds which he might receive amid the gymnaſtic exerciſes or in battle. His education was not confined to the gymnaſtic exerciſes; he was alſo taught to ſing the laws, which were written in verſe, with a certain ſpecies of melody; in order that the charms of muſic might diſpoſe him to learn them with more pleaſure, and might impreſs them more deeply on his heart, and that, if he ſhould ever tranſgreſs them, he might not have the excuſe of ignorance to offer. He next learned hymns in honour of the gods, and poems compoſed in praiſe of heroes. When he reached his ſeventeenth year, he retired from the ſociety of the adults, and became a member of that of the young men.

Here his education was ſtill carried on. He exerciſed himſelf in hunting, wreſtling, and fighting with his companions. The lyre played tunes of martial muſic; and he learned to follow exactly the ſounds and meaſure of the muſician. Thoſe ſports and exerciſes were ſometimes attended with danger; becauſe arms of ſteel were ſometimes uſed in them. One dance, in which the youth aſpired moſt ardently to excel, was the Pyrrhic, originally invented in Crete. The performers in that dance were arrayed in complete armour:—they wore a light ſhort coat, which did not fall below the knee, and was bound with a girdle going twice round the waiſt: on their feet and legs were buſkins; above theſe they bore their arms, and performed various military evolutions to the ſound of muſical inſtruments. "The Lacedemonians and Cretans (ſays Libanius) cultivated dancing with amazing ardour; they conſidered that their laws had directed them to practiſe it for the moſt important purpoſes; and it was ſcarce leſs diſhonourable for a Lacedemonian or Cretan to neglect the military dances, than to deſert his poſt in battle."

Thoſe Cretans who were opulent and high-born, were permitted to form ſocieties of young men of their own age. They often ſtrove, with emulation, who ſhould form the moſt numerous ones. The father of the young man who formed one of thoſe ſocieties uſually preſided in it. He had a right to educate thoſe warlike youth, to exerciſe them in running and in hunting, to confer rewards and inflict puniſhments.

Friendſhip was in high eſtimation among the Cretans; but, ſays Strabo, the manner in which they conducted the intercourſe of friendſhip was pretty extraordinary. Inſtead of mild perſuaſion, they made uſe of violence to gain the objects of their affections. He who conceived an affection for a young man of his own age, and wiſhed to attach him to himſelf by indiſſoluble bonds, formed a ſcheme for carrying him off by violence. Three days before putting it into execution, he communicated it to his comrades. They could not then interfere to prevent it; becauſe if they had, they would have appeared to think the young man unworthy of ſuch an exceſſive attachment. At the appointed day they aſſembled to protect their companion. If the raviſher appeared to them not unworthy of the object of his affection, they made at firſt a faint reſiſtance in obedience to the law—but, at laſt, joyfully favoured his enterpriſe; if, on the other hand, they thought him unworthy of the object of his choice, they made ſuch reſiſtance as to prevent him from executing his deſign. The feigned reſiſtance continued till the raviſher had conducted his friend into the hall of that ſociety to which he belonged. They did not regard him who poſſeſſed ſuperior beauty and gracefulneſs of perſon as the moſt amiable; but him who had moſt diſtinguiſhed himſelf by his modeſty and valour.

The raviſher loaded his young friend with favours, and conducted him wherever he deſired; they were accompanied by thoſe who had favoured the rape: he carried him from feaſt to feaſt, procured him the pleaſures of the chaſe and good cheer; and after uſing all poſſible means to gain his heart for the courſe of two months, brought him back to the city, and was obliged to give him up to his parents. But firſt he preſented him with a ſuit of armour, an ox, and a drinking cup; which were the uſual and legal preſents on ſuch occaſions. Sometimes his generoſity went ſtill farther; and he made more expenſive preſents; to defray the expence of which his comrades contributed. The young man ſacrificed the ox to Jupiter, and gave an entertainment to thoſe who had aſſiſted when he was carried off. He then declared his ſentiments concerning a connection with his raviſher, and told whether or not it was agreeable to him. If he had reaſon to complain of the treatment which he had received, the law allowed him to forſake a friend ſo unworthy of the name, and to demand his puniſhment.

It would have been diſgraceful, adds Strabo, to a young man who was handſome and well born, to be rejected by his friends on account of the depravity of his manners. Thoſe who had been carried off received public honours. Theirs were the firſt places in the halls and at the race. They were permitted to wear, during the reſt of life, thoſe ornaments which they owed to the tenderneſs of friendſhip; and that mark of diſtinction teſtified to all who ſaw them, that they had been the objects of ſome fond attachment.

When the youth had finiſhed their exerciſes, and attained the legal age, they became members of the claſs of adults; being then conſidered as men, they were permitted to vote in the national aſſemblies, and were entitled to ſtand candidates for any public office. They were then obliged to marry: but did not take home their wives till ſuch time as they were capable of managing their domeſtic concerns.

"The legiſlator (ſays Strabo) had conſidered liberty as the greateſt bleſſing that cities can enjoy. Liberty alone can ſecure the property of the citizens of any ſtate. Slavery either robs them of it, or renders it precarious. The firſt care of nations ſhould therefore be to preſerve their liberty. Concord ſtrengthens and ſupports her empire; ſhe flouriſhes wherever the ſeeds of diſſenſion are extinguiſhed. Almoſt all thoſe hoſtilities which prevail among nations or individuals ſpring either from an inordinate deſire of wealth or the love of luxury. Introduce, inſtead of thoſe baneful principles, frugality, moderation, and equality of conditions; you will thus baniſh envy, hatred, injuſtice, and haughty diſdain." This was what the Cretan lawgiver happily effected. And the community, which was regulated by his wiſe inſtitutions, roſe to glory, opulence, and power; and was honoured with the panegyrics of the moſt celebrated philoſophers of Greece: but the higheſt honour it ever obtained, was that of ſerving Lycurgus as a model for the admirable form of government which he eſtabliſhed at Sparta.

The republic of Crete continued to flouriſh till the age of Julius Cæſar. No other ſtate has enjoyed ſo long a period of ſtrength and grandeur. The legiſlature, regarding liberty as the only ſure baſis of a nation's happineſs, had inſtituted a ſyſtem of laws, the natural tendency of which was, to inſpire men with an ardent paſſion for liberty, and with ſuch virtue and valour as are neceſſary to ſupport and defend it. All the citizens were ſoldiers: all of them were ſkilled in the art of war. The valiant youth of other nations reſorted to Crete, to learn the exerciſes, manœuvres, and evolutions, of the military art. "Philopœmen (ſays Plutarch) being impatient of indolence, and eager to acquire ſkill in arms, embarked for Crete. After ſpending a conſiderable time in the nobleſt exerciſes among that brave people, who were ſkilled in the art of war, and accuſtomed to an auſtere and temperate life, he returned to the Achæans. The knowledge which he had acquired made him ſo eminent among them, that he was immediately appointed general of their cavalry."

On the other hand, the legiſlator, being perſuaded that conqueſts are generally unjuſt and criminal, that they often exhauſt the ſtrength of the victorious nation, and almoſt always corrupt its manners, endeavoured to preſerve the Cretans from the ambition of conqueſt. The fertility of the iſland abundantly ſupplied their wants. They needed not that commerce ſhould introduce among them the riches of foreign countries, along with which luxury and her train of attendant vices would alſo be introduced; and he knew how to inſpire them with an indifference for ſuch acquiſitions without expreſsly forbidding them. The gymnaſtic exerciſes, which occupied the leiſure of the gallant youth; the pleaſures of the chaſe; the ardour of friendſhip; the public ſhows, at which all the different orders of the community, both men and women, uſed to aſſemble; the love of equality, order, and their country, with which he inflamed every breaſt; the wiſe inſtitutions, which united a whole nation ſo cloſely that they compoſed but one family;—all theſe ties attached the Cretans to their native iſland: and finding at home that happineſs which was the object of their wiſhes, they never thought of wandering abroad in ſearch of an imaginary glory, or of extending their empire over other nations. Therefore, from the period at which that ſtate aſſumed a republican form till the time when they were attacked by the arms of Rome, the nation was not once known to ſend a hoſtile force into the territories of any of their neighbours. This inſtance of moderation is unparalleled in hiſtory; no other nation can divide the glory of it with the Cretans. Individuals indeed might leave their country to engage in foreign armies. Thoſe princes and ſtates who knew their valour and ſkill in archery eagerly ſought to take them into their pay; all the neighbouring monarchs were deſirous of having in their armies a body of Cretan archers. Over the whole world none were more celebrated than they for bending the bow. "The arrows of Gortynia (ſays Claudian), aimed from a truſty bow, are ſure to wound, and never miſs the deſtined mark."

Though the multitude of independent cities which flouriſhed in Crete did not unite their arms to ſubjugate the neighbouring iſlands, and drench them with the blood of their inhabitants; yet they were not ſo wiſe as to live in peace among themſelves. Diſcord often ſtalked among them with her flaming torch. The moſt powerful wiſhed to enſlave the reſt. Sometimes Gnoſſus and Gortynia marched with ſocial banners againſt their neighbours, levelled their fortreſſes, and ſubjected them to their power; at other times they attacked each other with hoſtile violence, and ſaw their braveſt youth periſh amid the horrors of civil war. Lyctos and Cydon oppoſed an invincible barrier to their ambition, and preſerved their own liberty. The laſt of theſe cities had acquired ſuch ſtrength and influence, that ſhe held the balance between the rival powers of the iſland. Thoſe wars deſtroyed a number of the cities, and drenched the native country of Jupiter with blood.

To what ſource muſt we attribute thoſe inteſtine diſſenſions? One part of the iſland was occupied by the Eteocretes, the original inhabitants; the reſt was peopled with colonies from Athens, Sparta, Argos, and Samos. Perhaps the ancient grudges which had ſubſiſted among thoſe ſtrangers, being ſtill unextinguiſhed in their breaſts, were eaſily rekindled by accident or circumſtances, and inflamed with new fury. We may alſo ſuppoſe, that the moſt powerful among them, exulting in their ſuperiority, would endeavour to take advantage of the weakneſs of the reſt, and diſregard all laws but thoſe of force: beſides, the glowing ardour of the youth, trained to military exerciſes, was ever ready to fly to arms. Such, probably, were the cauſes which fomented diſcord and hoſtility among a people living under the ſame religion, cuſtoms, and laws.—Whatever theſe might be, the Cretans being perſuaded that the firm union of their ſoldiers was eſſential to victory, arrayed the braveſt youths of the army in ſplendid robes, and cauſed them to ſacrifice to friendſhip before engaging in battle. In ſome countries it would be very proper to oblige the generals on ſuch occaſions, to ſacrifice to concord. If ſuch a ſacrifice were performed with ſincerity, it might preſerve their glory unſtained, and prevent ſuch deluges of blood from being waſted without producing any advantages to the ſtate.

Their paſſion for war did not extinguiſh in the breaſts of the Cretans that exquiſite ſenſibility which is the mother and nurſe of the fine arts. "The Cretans (ſays Sozomen) gave an illuſtrious proof of their munificence to genius, by making Homer a preſent of a thouſand pieces of ſilver; and to perpetuate the memory of this act of generoſity, they recorded it by an inſcription on a public column." In Crete, adds Ptolemy, men are ſtill more deſirous of cultivating their underſtandings than of exerciſing their bodily powers. Often when diſſenſions aroſe, the voice of wiſdom and the charms of poeſy recalled them to reaſon and harmony. Thales of Gortynia, the preceptor of Lycurgus, was one of their moſt celebrated philoſophers. Being both a poet and legiſlator, he made a happy uſe of his abilities and knowledge to extinguiſh among his countrymen the kindling ſparks of diſcord. “His poems were moral diſcourſes in verſe, which recalled the people to concord and ſubmiſſion to the laws. Uſing a regular meaſure, he recommended the auſterity of his ſubject by the inſinuating and powerful charm of ſentiment. So powerful were the effects of his verſes, which addreſſed at once the ears, the heart, and the underſtanding of his hearers, that their rage was gradually ſoftened. Next, opening their hearts to the love of peace, the advantages of which he deſcribed in glowing colours, they forgot their inteſtine diſſenſions, and ranged themſelves around the ſtandard of concord.” That ſage is ſaid to have invented tunes for the military dances and for the Cretan Pyrrhic. Men who felt ſo ſtrongly the influence of poetry and muſic could ſcarcely be enemies to pleaſure. Accordingly they had a cuſtom of diſtinguiſhing their fortunate days with white flint ſtones, their unfortunate days with black. At the end of the year they counted the number of their white ſtones, and reckoned that they had lived only ſo many days as were diſtinguiſhed for having been fortunate. They did not think mere exiſtence, without the enjoyment of pleaſure, worthy of the name of *life*. For this reaſon, they cauſed to be inſcribed on their tombs: “He lived ſo many days; he continued in exiſtence ſo long.”

A paſſion for glory is eaſily awaked in a feeling and generous breaſt. The Cretans eagerly repaired to the famous ſolemnities of Greece, and were often crowned at the Olympic, Nemæan, and Pythian games; others of them were favourites of the muſes, and verſified the predictions of prophets, or celebrated the glorious deeds of their heroes. Several of them diſtinguiſhed themſelves by hiſtorical compoſitions. At the moſt ancient games, a prize is ſaid to have been beſtowed on the poet who ſung the nobleſt hymn in honour of Apollo: Chryſothemis of Crete ſung and gained the prize.

The ravages of time have deprived us of almoſt all their works; and if Pindar had not preſerved the memory of ſome of their crowns, we ſhould not know even the names of the conquerors who wore them. The temple of Diana at Epheſus, built by the Cretan Cteſiphon and his ſon Metagenes, was not proof againſt the frantic hand of the incendiary. Thoſe ingenious architects had built it on the principles of the Ionic order: to the coſtlineſs of the materials, the elegance of the architecture, the ſymmetry of the parts, and the majeſty and perfection of the whole, they had added ſolidity and ſtrength, without which the reſt muſt have been of ſmall value. Their names have deſcended to poſterity, but the pillars of that monument which has perpetuated their memory have been diſperſed or deſtroyed. Scarce a veſtige remains of that building which was eſteemed one of the ſeven wonders of the world.

Nations are effaced from the earth like the monuments of their power, and after the revolution of ſeveral ages we can ſcarcely trace in their poſterity any remains of their ancient character. Some of them exiſt longer, others ſhorter; but we may almoſt always calculate the period of their duration by the excellence of their laws, and the fidelity with which they ſupport and obey them. The republic of Crete, being eſtabliſhed on a ſolid baſis, knew no foreign maſter for a period of ten centuries. She bravely repelled the attacks of thoſe princes who attempted to enſlave her. At length the time arrived when the warlike and victorious Romans aſpired to the empire of the world, and would ſuffer none but their ſubjects or ſlaves to inhabit within the reach of their arms. Florus does not ſcruple to acknowledge, that the Romans had no other motives for invading Crete but the ambitious deſire of ſubduing the renowned native country of Jupiter. “If any perſon wiſh to know the reaſons which induced us to attack Crete (ſays he), the true reaſon was our deſire to ſubdue ſo celebrated an iſland. The Cretans had appeared to favour Mithridates, and the Romans thought proper to declare war againſt them on that pretext. Mark Antony, father of the triumvir, attacked them with ſtrong hopes of ſucceſs; but was ſeverely puniſhed for his preſumption and imprudence. The Cretans took a great part of his fleet, hung up his ſoldiers and ſailors on the maſts amid the ſails and cordage, and returned in triumph into their harbours.”

The Romans never forgot nor forgave a defeat. As ſoon as the Macedonian war was brought to a happy concluſion, they again took arms againſt the Cretans to revenge their ignominy and loſs. Quintus Metellus was ſent to Crete with a powerful armament. He met with an obſtinate and vigorous reſiſtance. Panarus and Laſthenes, two experienced leaders, collecting a body of 20,000 young warriors, all eager for battle, and of determined courage, employed their arms and arrows ſucceſsfully againſt the Romans, and protracted the fate of Crete for three years. Thoſe conquerors could not make themſelves maſters of the iſland before deſtroying its braveſt warriors. They loſt a great number of troops, and bought a bloody victory at the price of many a danger and much fatigue. However, their uſual good fortune at length prevailed. The firſt care of the conqueror was to aboliſh the laws of Minos, and to eſtabliſh in their room thoſe of Numa. Strabo, that enlightened philoſopher, complains of this act of ſeverity; and informs us, that in his days the original laws of Crete were no longer in force, becauſe the Romans compelled the conquered provinces to adopt their civil code. To ſecure themſelves ſtill more fully in the poſſeſſion of the iſland, they ſent a powerful colony to Gnoſſus.

From that era to the preſent time, that is, for a period of 1900 years, the Cretans have no longer formed a ſeparate nation, or made any figure among the ſtates and kingdoms of the world: their noble and ingenuous manners, their arts and ſciences, their valour and their virtues, are no more. They have loſt theſe with the loſs of liberty. So true it is that man is not born for himſelf; and that, when deprived of that aid which Nature has deſigned to ſtrengthen and ſupport his weakneſs, the flame of genius and the ardent glow of valour are extinguiſhed in his breaſt; he becomes incapable of vigorous reſolution, and ſinks below the natural virtue and dignity of the ſpecies.

The iſland of Crete, joined with the ſmall kingdom of Cyrene, on the Libyan coaſt, formed a Roman province. It was at firſt governed by a proconſul; a queſtor and an aſſiſtant were afterwards ſent there; at laſt, as Suetonius informs us, it was put under the government of a conſul. This iſland was one of the firſt places in the world that were favoured with the light of the goſpel. St Paul introduced the Chriſtian faith into Crete; and his diſciple Titus, whom he left there to cheriſh and cultivate that precious plant, became the firſt biſhop of the iſland. In the reign of the emperor Leo, it had twelve biſhops, who were all ſubject to the patriarch of Conſtantinople. Conſtantine ſeparated Crete from Cyrene in the new diviſion which he made of the provinces of the empire. Leaving three ſons, Conſtantius, Conſtantine, and Conſtans, he aſſigned Thrace and the eaſtern provinces to the firſt; to the ſecond, the empire of the weſt; the iſland of Crete, Africa, and Illyria, to the third.

When Michael Balbus ſat on the throne of Conſtantinople, the rebellion of Thomas, which laſted three years, cauſed him to neglect the other parts of the empire. The Agarenians (a people of Arabia), who had conquered the fineſt provinces of Spain, ſeized that opportunity. They fitted out a conſiderable fleet, plundered the Cyclades, attacked the iſland of Crete, and made themſelves maſters of it without oppoſition. In order to ſecure their conqueſt, they built a fortreſs which they named *Khandak*, "intrenchment." From that citadel the barbarians made inroads into the interior parts of the iſland, carrying havock and devaſtation wherever they appeared. By repeated attacks, they ſubdued all the cities in Crete except Cydon. Michael made ſome ineffectual efforts to expel them from Crete. The emperor Baſilius, the Macedonian, was not more ſucceſsful. They defeated him in a bloody battle; but being vanquiſhed by one of his generals, they were ſubjected to the payment of an annual tribute. At the end of ten years, the Arabians refuſed the tribute. It was reſerved for Nicephorus Phocas, who was afterwards emperor, to deliver this fine iſland from the yoke of the infidels. He landed on the iſland with a numerous army, boldly attacked them, and routed them in various engagements. The Saracens, no longer daring to meet ſo formidable a general in the field, fled for protection to their fortreſſes. Phocas being plentifully ſupplied with all the warlike machines neceſſary for a ſiege, levelled their walls, and alarmed their hearts with terror. He took their cities and fortreſſes, and drove them into Khandak their metropolis and laſt reſource. In the courſe of nine months he ſubdued the whole iſland, took their king Curup and his lieutenant Aremas priſoners, and reunited to the empire a province which had been 127 years in the hands of the infidels. It remained under the dominion of the Romans till the time when Baldwin count of Flanders, being raiſed to the throne, liberally rewarded the ſervices of Boniface maquis of Montferrat, by making him king of Theſſalonica, and adding the iſland of Crete to his kingdom. That lord, being more covetous of gold than glory, ſold it to the Venetians in the year 1194; under whom it aſſumed the name of CANDIA. See the ſequel of its hiſtory under that article.

CRETIO, in antiquity, a certain number of days allowed the heir to conſider whether he would act as heir to the deceaſed or not; after which time, if he did not act, he was excluded from the ſtate.

CREUX, a term in ſculpture, much uſed by the French; though not yet, that we know of, naturalized among us: but the want of a word of equal import in Engliſh, as it has frequently put us under a neceſſity of uſing this in the courſe of the preſent work; ſo it pleads ſtrongly for its admiſſion into our language.

Creux originally ſignifies a *hollow*, *cavity*, or *pit*, out of which ſomething has been ſcooped or dug: hence it is uſed to denote that kind of ſculpture and graving where the lines and figures are cut and formed within the face or plane of the plate or matter engraven on. In which ſenſe it ſtands oppoſed to relievo; where the lines and figures are emboſſed, and appear prominent above the face of the matter.

CREW, the company of ſailors belonging to a ſhip, boat, or other veſſel.

The ſailors that are to work and manage a ſhip are regulated by the number of laſts it may carry; each laſt making two tons. The crew of a Dutch ſhip, from 40 to 50 laſts, is ſeven ſailors and a ſwabber; from 50 to 60 laſts, the crew conſiſts of eight men and a ſwabber; and thus increaſes at the rate of one man for every ten laſts; ſo that a ſhip of 100 laſts has 12 men, &c. Engliſh and French crews are uſually ſtronger than Dutch; but always in about the ſame proportion. In a ſhip of war there are ſeveral particular crews, or gangs, as the boatſwain's crew, the carpenter's crew, the gunner's crew, &c.

CREVIER, JOHN BAPTIST LEWIS, a Pariſian, was trained under the celebrated Rollin, and afterwards became profeſſor of rhetoric. Upon the death of his maſter, in 1741, he took upon him to finiſh his Roman Hiſtory. He publiſhed other words, and was greatly ſerviceable to the cauſe of virtue and religion as well as letters. His death happened in 1765, at a very advanced age. Beſides the continuation juſt mentioned, he publiſhed, 1. An edition of *Livius, cum Notis*, in 6 vols 4to, 1748; and afterwards another edition, better adapted to the uſe of his pupils, in 6 vols ſmall 8vo. 2. *La Hiſtoire des Empereurs des Romains juſqu'à Conſtantin*, 1749. 12 tom. 12mo. 3. *Hiſtoire de l'Univerſité de Paris*, 7 tom. 12mo. 4. *Rhetorique Francoiſe*, a juſt and uſeful work. 5. *Obſervations ſur l'Eſprit des Loix*. Here he ventured out of his depth; he ſhould have kept within the precincts of the belles letters.

CREUSA, in fabulous hiſtory, daughter of Creon king of Corinth. As ſhe was going to marry Jaſon, who had divorced Medea, ſhe put on a poiſoned garment, which immediately ſet her body on fire, and ſhe expired in the moſt excruciating torments. She had received this gown as a gift from Medea, who wiſhed to take that revenge upon the infidelity of Jaſon. Some call her *Glauce*. (*Ovid. de Art Am.* i. 335.) A daughter of Priam, king of Troy, by Hecuba. She married Æneas, by whom ſhe had, among other children, Aſcanius. When Troy was taken, ſhe fled in the night with her huſband; but they were ſeparated in the midſt of the confuſion and tumult, and Æneas could not recover her, nor hear where ſhe was. Some ſay that Cybele ſaved her, and carried her to her temple, of which ſhe became prieſteſs. *Pauſ.* x. 25.—*Virg. Æn.* iii. 592.

CREX, a ſpecies of RALLUS. See ORNITHOLOGY *Index*.

CRIB, the rack or manager of a ſtable, or the ſtall or cabin of an ox. It is alſo uſed for any ſmall habitation, as a cottage, &c.

Crib, in the Engliſh ſalt-works, a name given to a ſort of caſe uſed in ſome places inſtead of the *drab*, to put the ſalt into as it is taken out of the boiling pan.

Cribbage, a game at cards, to be learnt only by practice.

CRIBRATION, in *Pharmacy*, the paſſing any ſubſtance through a ſieve or ſearce, in order to ſeparate the finer particles from the groſſer.

CRIBROSUM os, in *Anatomy*, called alſo *os ethmoides*. See Anatomy *Index*.

CRICELASIA, the driving a ring or hoop. Driving a hoop was one of the ancient gymnaſtics: this hoop was as high as the breaſt of the perſon who uſed it. It was commended for rendering the limbs pliable, and for ſtrengthening the nerves.

CRICETUS. See Mus, Mammalia *Index*.

CRICHTON, James, a Scots gentleman, who lived in the 16th century, and who, on account of his extraordinary endowments both of body and mind, obtained the appellation of "the admirable Crichton;" by which title he has been diſtinguiſhed to the preſent day. The time of this celebrated perſon's birth is ſaid, by the generality of writers, to have been in 1551; but according to ſome he was born in Auguſt 1560. There is a difference likewiſe between the biographers of this extraordinary man, with regard to his family, and the rank and ſituation of his father. By ſome it is aſſerted, that James Crichton's father was Robert Crichton of Clunie, in the county of Perth; and that this Robert Crichton commanded Queen Mary's army at the battle of Langſide in the year 1568. But it is ſaid by others, that this gentleman was of Elliock in the ſame county, and that he was lord advocate of Scotland in Queen Mary's reign from 1561 to 1573; part of which time he held that office in conjunction with Spens of Condie. The mother of James Crichton was Elizabeth Stuart, the only daughter of Sir James Stuart of Beath, who was a deſcendant of Robert duke of Albany the third ſon of King Robert the ſecond, by Elizabeth Muir or More, as ſhe is commonly called; ſo that when the admirable Crichton boaſted (as he did abroad), that he was ſprung from Scottiſh kings, he ſaid nothing but what was agreeable to truth.

James Crichton is ſaid to have received his grammatical education at Perth, and to have ſtudied philoſophy in the univerſity of St Andrew's. His tutor in that univerſity was Mr John Rutherford, a profeſſor at that time famous for his learning, and who diſtinguiſhed himſelf by writing four books on Ariſtotle's logic and a commentary on his poetics. According to Aldus Manutius, who calls Crichton firſt couſin to the king, he was alſo inſtructed, along with his majeſty, by Buchanan, Hepburn, and Robertſon, as well as by Rutherford; and he had ſcarcely arrived at the 20th year of his age, when he had run through the whole circle of the ſciences, and could ſpeak and write to perfection in ten different languages. Nor was this all; for he had likewiſe improved himſelf to the higheſt degree in riding, dancing, and ſinging, and in playing upon all ſorts of inſtruments.

Crichton, being thus accompliſhed, went abroad upon his travels, and is ſaid to have gone to Paris; of his tranſactions at which place the following account is given. He cauſed placards to be fixed on all the gates of the ſchools, halls, and colleges belonging to the univerſity, and on all the pillars and poſts before the houſes of the moſt renowned men for literature in the city, inviting all thoſe who were well verſed in any art or ſcience, to diſpute with him in the college of Navarre, that day ſix weeks, by nine of the clock in the morning, where he would attend them, and be ready to anſwer to whatever ſhould be propoſed to him in any art or ſcience, and in any of theſe 12 languages, Hebrew, Syriac, Arabic, Greek, Latin, Spaniſh, French, Italian, Engliſh, Dutch, Flemiſh, and Sclavonian; and this either in verſe or proſe at the diſcretion of the diſputant. During this whole time, inſtead of cloſely applying to his ſtudies, he regarded nothing but hunting, hawking, tilting, vaulting, riding of a well managed horſe, toſſing the pike, handling the muſket, and other military feats; or elſe he employed himſelf in domeſtic games, ſuch as balls, concerts of muſic vocal and inſtrumental, cards, dice, tennis, and the like diverſions of youth. This conduct ſo provoked the ſtudents of the univerſity, that, beneath the placard which was fixed on the Navarre gate, they cauſed the following words to be written: "If you would meet with this monſter of perfection, to make ſearch for him either in the tavern or bawdy-houſe is the readieſt way to find him." Neverthelefs, when the day appointed arrived, Crichton appeared in the college of Navarre, and acquitted himſelf beyond expreſſion in the diſputation, which laſted from nine o'clock in the morning till ſix at night. At length, the preſident, after extolling him highly for the many rare and excellent endowments which God and nature had beſtowed upon him, roſe from his chair, and accompanied by four of the moſt eminent profeſſors of the univerſity, gave him a diamond ring and a purſe full of gold, as a teſtimony of their love and favour. The whole ended with the repeated acclamations and huzzas of the ſpectators; and henceforward our young diſputant was called, "the admirable Crichton." It is added, that he was ſo little fatigued with the diſpute, that he went on the very next day to the Louvre, where he had a match of tilting (an exerciſe then in much requeſt), and in the preſence of ſome of the princes of the court of France, and a great many ladies, carried away the ring 15 times ſucceſſively.

About two years after this we find him at Rome, where he affixed a placard upon all the eminent places of the city, in the following terms: *Nos Jacobus Crichtonus Scotus, cuicumque rei propoſitæ ex improviſo reſpondebimus.* In a city which abounded in wit, this bold challenge, to anſwer to any queſtion that could be propoſed to him without his being previouſly advertiſed of it, could not eſcape the ridicule of a paſquinade. It is ſaid, however, that being nowiſe diſcouraged, he appeared at the time and place appointed; and that, in the preſence of the pope, many cardinals, biſhops, doctors of divinity, and profeſſors in all the ſciences, he diſplayed ſuch wonderful proofs of his univerſal knowledge, that he excited no leſs ſurpriſe that he had done at Paris. Boccalini, who was then at Rome, gives ſomething of a different relation of the matter. According to this author, the paſquinade againſt Crichton, which was to the following effect, "*And he that will ſee* it, *let him go to the ſign of the Falcon and* it *ſhall be ſhown*," made ſuch an impreſſion upon him, that he left a place where he had been ſo groſsly affronted as to be put upon a level with jugglers and mountebanks.

From Rome he went to Venice; where he contracted an intimate friendſhip with Aldus Manutius, Laurentius Maſſa, Speron Speronius, Johannes Donatus, and various other learned perſons, to whom he preſented ſeveral poems in commendation of the city and univerſity. At length he was introduced to the doge and ſenate, in whoſe preſence he made a ſpeech, which was accompanied with ſuch beauty of eloquence, and ſuch grace of perſon and manner, that he received the thanks of that illuſtrious body, and nothing was talked of through the whole city but this *rara in terris avis*, this prodigy of nature. He held, likewiſe, diſputations on the ſubjects of theology, philoſophy, and mathematics, before the moſt eminent profeſſors, and large multitudes of people. His reputation was ſo great, that the deſire of ſeeing and hearing him brought together a vaſt concourſe of perſons from different quarters to Venice. It may be collected from Manutius, that the time in which Crichton exhibited theſe demonſtrations of his abilities was in the year 1580.

During his reſidence at Venice, he fell into a bad ſtate of health, which continued for the ſpace of four months. However, before he was perfectly recovered, he went, by the advice of his friends, to Padua, the univerſity of which city was at that time in great reputation. The next day after his arrival, there was a meeting of all the learned men of the place, at the houſe of Jacobus Aloyſius Cornelius; when Crichton opened the aſſembly with an extemporary poem in praiſe of the city, the univerſity, and the company who had honoured him with their preſence. After this, he diſputed for ſix hours with the moſt celebrated profeſſors on various ſubjects of learning; and he expoſed, in particular, the errors of Ariſtotle and his commentators, with ſo much ſolidity and acuteneſs, and at the ſame time with ſo much modeſty, that he excited univerſal admiration. In concluſion, he delivered extempore an oration in praiſe of ignorance, which was conducted with ſuch ingenuity and elegance, that his hearers were aſtoniſhed. This exhibition of Crichton's talents was on the 14th of March 1581. Soon after he appointed a day for another diſputation to be held at the palace of the biſhop of Padua; not for the purpoſe of affording higher proofs of his abilities, for that could not poſſibly be done, but in compliance with the earneſt ſolicitations of ſome perſons who were not preſent at the former aſſembly. However, ſeveral circumſtances occurred which prevented this meeting from taking place. Such is the account of Manutius: but Imperialis relates, that he was informed by his father, who was preſent upon the occaſion, that Crichton was oppoſed by Archangelus Mercenarius, a famous philoſopher; and that he acquitted himſelf ſo well as to obtain the approbation of a very honourable company, and even of his antagoniſt himſelf.

Amidſt the diſcourſes which were occaſioned by our young Scotſman's exploits, and the high applauſes that were beſtowed upon his genius and attainments, there were not wanting ſome who endeavoured to detract from his merit. For ever, therefore, to confound theſe invidious impugners of his talents, he cauſed a paper to be fixed on the gates of St John and St Paul's church, wherein he offered to prove before the univerſity, that the errors of Ariſtotle, and of all his followers, were almoſt innumerable; and that the latter had failed both in explaining their maſter's meaning, and in treating on theological ſubjects. He promiſed likewiſe to refute the dreams of certain mathematical profeſſors; to diſpute in all the ſciences, and to anſwer to whatever ſhould be propoſed to him or objected againſt him. All this he engaged to do, either in the common logical way, or by numbers and mathematical figures, or in 100 ſorts of verſes, at the pleaſure of his opponents. According to Manutius, Crichton ſuſtained this conteſt, without fatigue, for three days; during which time he ſupported his credit, and maintained his propoſitions, with ſuch ſpirit and energy, that from an unuſual concourſe of people, he obtained acclamations and praiſes, than which none more magnificent were ever heard by men.

From Padua, Crichton ſet out for Mantua; where there happened to be at the time a gladiator, who had foiled in his travels the moſt famous fencers in Europe, and had lately killed three who had entered the liſts with him in this city. The duke of Mantua was much grieved at having granted this man his protection, as he found it to be attended with ſuch fatal conſequences. Crichton, being informed of his highneſs's concern, offered his ſervice, not only to drive the murderer from Mantua, but from Italy; and to fight him for 1500 piſtoles. Though the duke was unwilling to expoſe ſuch an accompliſhed gentleman to ſo great a hazard; yet relying upon the report he had heard of his warlike atchievements, he agreed to the propoſal; and the time and place being appointed, the whole court attended to behold the performance. At the beginning of the combat Crichton ſtood only upon his defence; while the Italian made his attack with ſuch eagerneſs and fury, that, having overacted himſelf, he began to grow weary. Crichton now ſeized the opportunity of attacking his antagoniſt in return; which he did with ſo much dexterity and vigour, that he ran him through the body in three different places, of which wounds he immediately died. The acclamations of the ſpectators were loud and extraordinary upon this occaſion; and it was acknowledged by all of them, that they had never ſeen Art grace Nature, or Nature ſecond the precepts of Art, in ſo lively a manner as they had beheld theſe two things accompliſhed on that day. To crown the glory of the action, Crichton beſtowed the prize of his victory upon the widows of the three perſons who had loſt their lives in fighting with the gladiator.

It is aſſerted, that in conſequence of this and his other wonderful performances, the duke of Mantua made choice of him for preceptor to his ſon Vincentio di Gonzaga, who is repreſented as being of a riotous temper and a diſſolute life. The appointment was highly pleaſing to the court. Crichton, to teſtify his gratitude to his friends and benefactors, and to contribute to their diverſion, framed, we are told, a comedy wherein he expoſed and ridiculed all the weakneſſes and failures of the ſeveral employments in which men are engaged. This compoſition was regarded as one of the moſt ingenious ſatires that ever was made upon mankind. But the moſt aſtoniſhing part of the ſtory is, that Crichton ſuſtained 15 characters in the repreſentation of his own play. Among the reſt, he acted the divine, the philoſopher, the lawyer, the mathematician, the phyſician, and the ſoldier, with ſuch inimitable grace, that every time he appeared on the theatre he ſeemed to be a different perſon.

From being the principal actor in a comedy, Crichton ſoon became the ſubject of a dreadful tragedy. One night, during the time of carnival, as he was walking along the ſtreets of Mantua, and playing upon his guitar, he was attacked by half a dozen people in maſks. The aſſailants found that they had no ordinary perſon to deal with, for they were not able to maintain their ground againſt him. In the iſſue, the leader of the company being diſarmed, pulled off his maſk, and begged his life, telling him that he was the prince his pupil. Crichton immediately fell upon his knees and expreſſed his concern for his miſtake; alleging, that what he had done was only in his own defence, and that if Gonzaga had any deſign upon his life, he might always be maſter of it. Then taking his own ſword by the point, he preſented it to the prince, who immediately received it, and was ſo irritated by the affront which he thought he had ſuſtained in being foiled with all his attendants, that he inſtantly ran Crichton through the heart.

Various have been the conjectures concerning the motives which could induce Vincentio di Gonzaga to be guilty of ſo ungenerous and brutal an action. Some have aſcribed it to jealouſy, aſſerting that he ſuſpected Crichton to be more in favour than himſelf with a lady whom he paſſionately loved; and Sir Thomas Urquhart has told a ſtory upon this head which is extravagant and ridiculous in the higheſt degree. Others, with greater probability, repreſent the whole tranſaction as the reſult of a drunken frolic: and it is uncertain, according to Imperialis, whether the meeting of the prince and Crichton was by accident or deſign. However, it is agreed on all hands that Crichton loſt his life in this rencounter. The time of his deceaſe is ſaid, by the generality of his biographers, to have been in the beginning of July 1583; but others fix it to the ſame month in the preceding year. There is a difference, likewiſe, with regard to the period of life at which Crichton died. The common accounts declare that he was killed in the 32d year of his age: but Imperialis aſſerts that he was only in his 22d year when that calamitous event took place; and this fact is confirmed by other writers.

Crichton's tragical end excited a very great and general lamentation. If Sir Thomas Urquhart is to be credited, the whole court of Mantua went three quarters of a year into mourning for him; the epitaphs and elegies that were compoſed upon his death and ſtuck upon his hearſe, would exceed, if collected, the bulk of Homer's works; and, for a long time afterwards, his picture was to be ſeen in moſt of the bedchambers and galleries of the Italian nobility, repreſenting him on horſeback, with a lance in the one hand and a book in the other. The ſame author tells us, that Crichton gained the eſteem of kings and princes, by his magnanimity and knowledge; of noblemen and gentlemen, by his courtlineſs and breeding; of knights, by his honourable deportment and pregnancy of wit; of the rich, by his affability and good fellowſhip; of the poor, by his munificence and liberality; of the old, by his conſtancy and wiſdom; of the young by his mirth and gallantry; of the learned, by his univerſal knowledge; of the ſoldiers, by his undaunted valour and courage; of the merchants and artificers by his upright dealing and honeſty; and of the fair ſex, by his beauty and handſomeneſs, in which reſpect he was a maſterpiece of nature.

Joannes Imperialis, in his life of Crichton, ſays, that he was the wonder of the laſt age; the prodigious production of nature; the glory and ornament of Parnaſſus, in a ſtupendous and unuſual manner; and that, in the judgment of the learned world, he was the phœnix of literature, and rather a ſhining particle of the Divine Mind and Majeſty than a model of what could be attained by human induſtry. The ſame author, after highly celebrating the beauty of his perſon, aſſerts, that his extraordinary eloquence and his admirable knowledge of things teſtified that he poſſeſſed a ſtrength of genius wholly divine. "What (adds this writer) can more exceed our comprehenſion, than that Crichton, in the 21ſt year of his age, ſhould be maſter of ten different languages, and perfectly well verſed in philoſophy, mathematics, theology, polite literature, and all other ſciences? Beſides was it ever heard in the whole compaſs of the globe, that to theſe extraordinary endowments of the mind, ſhould be added a ſingular ſkill in fencing, dancing, ſinging, riding, and in every exerciſe of the gymnaſtic art?" Nay, Imperialis, in his account of Crichton's death, declares, that the report of ſo ſad a cataſtrophe was ſpread to the remoteſt parts of the earth; that it diſturbed univerſal nature; and that in her grief for the loſs of the wonder ſhe had produced, ſhe threatened never more to confer ſuch honour upon mankind. Compared with theſe extravagancies, the aſſertion of Bayle that Crichton was one of the greateſt prodigies of wit that ever lived, and the teſtimony of Felix Aſtolfus concerning his wonderful memory, may be conſidered as modeſt encomiums.

Such are the accounts which, by a ſucceſſion of writers, and particularly ſince the time of Mackenzie, have been given of the admirable Crichton. Theſe accounts are indeed ſo wonderful, that many perſons have been diſpoſed to conſider them as in a great meaſure, if not entirely, fabulous. We ſhall therefore ſubjoin from the *Biographia Britannica* the following obſervations of Dr Kippis, with a view to aſcertain what portion of faith is due to the different parts of the preceding narrative, or at leaſt to aſſiſt the reader in forming a proper judgment concerning them.

The doctor begins with obſerving, "That no credit can be granted to any facts that depend upon the ſole authority of Sir Thomas Urquhart. Mr Pennant indeed ſpeaks of him with approbation; and Dr Samuel Johnſon laid a ſtreſs on his veracity, in the account of Crichton which he dedicated to Dr Hawkeſworth, and is inſerted in the 81ſt number of the Adventurer; of which account it may be obſerved, that it is only an elegant ſummary of the life written by Mackenzie. But with all deference to theſe reſpectable names, I muſt declare my full perſuaſion that Sir Thomas Urquhart is an author whoſe teſtimony to facts is totally unworthy of regard; and it is ſurpriſing that a peruſal of his works does not ſtrike every mind with this conviction. His productions are ſo inexpreſſibly abſurd and extravagant, that the only rational judgment which can be pronounced concerning him is, that he was little, if at all, better than a madman. To the character of his having been a madman muſt be added that of his being a liar. Severe as this term may be thought, I apprehend that a diligent examination of the treatiſe which contains the memorials concerning Crichton would ſhow that it is ſtrictly true. But of his total diſregard to truth there is inconteſtable evidence in another work of his, entitled, The true Pedigree and Lineal Deſcent of the moſt ancient and honourable Family of the Urquharts in the Houſe of Cromarty, from the Creation of the World until the year of God 1652. In this work it is almoſt incredible what a number of falſities he has invented both with reſpect to names and facts. Perhaps a more flagrant inſtance of impoſture and fiction was never exhibited; and the abſurdity of the whole pedigree is beyond the power of words to expreſs. It can only be felt by thoſe who have peruſed the tract itſelf. Such a man therefore can juſtly be entitled to no degree of credit, eſpecially when he has a purpoſe to ſerve, as was the caſe with Sir Thomas Urquhart. His deſign was to exalt his own family and his own nation at any rate. With reſpect to his own nation, there was no occaſion for having recourſe to fiction, in order to diſplay the luſtre of Scotland, in the eminent men whom it has produced in arms and literature. The pencil of truth alone would have been amply ſufficient for that purpoſe (A).

“ So far therefore as Sir Thomas Urquhart's authority is concerned, the wonderful exhibitions of Crichton at Paris, his triumph at Rome, his combat with the gladiator, his writing an Italian comedy, his ſuſtaining fifteen characters in the repreſentation of that comedy, the extraordinary ſtory of the amour which is deſcribed as the cauſe of his death, the nine months mourning for him at Mantua, and the poems hung round his hearſe to the quantity of Homer's works, muſt be regarded as in the higheſt degree doubtful, or rather abſolutely falſe. I cannot forbear mentioning two circumſtances, which ſhow how much Sir Thomas Urquhart was deſtitute of prudence, as well as of ſcrupuloſity, in his violations of truth. He ſays that the duke of Mantua was pleaſed to confer upon the young lady that was Crichton's miſtreſs and future wife, a penſion of five hundred ducats a year; and that the prince alſo beſtowed as much upon her during all the days of his life, “ which was (adds Sir Thomas) but ſhort; for he did not long enjoy himſelf after the croſs fate of ſo miſerable an accident. Now it is well known that Vincenzo di Gonzaga ſucceeded his father in the dukedom of Mantua in 1587, and that he did not die till the year 1612; which was almoſt, if not entirely, thirty years after Crichton's deceaſe. The other inſtance of the imprudence of Sir Thomas Urquhart in the contrivance of his fictions, occurs at the concluſion of his narrative, where he aſſerts that the verity of the ſtory which he hath related concerning the incomparable Crichton, ‘ may be certified by two thouſand men yet living who have known him.’ *Two thouſand men yet living!* that is, in 1652, ſixty-nine or ſeventy years after Crichton's death, for ſuch was the time of Sir Thomas's publication. Our author would have been ſadly puzzled to collect together theſe two thouſand living witneſſes who could certify the verity of his ſtory.

“ With regard, however, to the account which is given of the prodigious exertions of Crichton, both corporeal and mental, at Paris, Mackenzie imagines that he has found a full confirmation of them in a paſſage produced by him from the *Diſquiſitiones* of Stephen Paſquier, and which he conſiders as the teſtimony of an eye-witneſs. But the whole of what has been built upon it by Mackenzie, and ſucceeding biographers, is founded on a miſtake. In the quotation from the *Diſquiſitiones*, the name of Crichton is not mentioned, and the author doth not appear to have been perſonally preſent at the exhibitions of the extraordinary youth there deſcribed. The expreſſions which are ſuppoſed to carry that meaning may well be referred not to the writer himſelf, but to his countrymen the French, before whom the young man is ſaid to have diſplayed his ſurpriſing talents. But the diſcuſſion of this point is totally needleſs, becauſe the paſſage in queſtion is not an original authority. The book entitled *Stephani Paſchieri Diſquiſitiones* is only an abridgement in Latin of Paſquier's *Des Recherches de la France*. Now, in this laſt work there is indeed an account of a wonderful youth, ſuch as is related in Mackenzie's quotation, and from which that paſſage was formed. But this wonderful youth, whoever he might be, was not the admirable Crichton: for Paſquier, who does not tell his name, expreſsly ſays that he appeared in the year 1445 (B). The evidence therefore, produced by Mackenzie falls entirely to the ground. Indeed, if the ſtory of Crichton's exploits at

Paris

(A) This was probably meant as a ſatire, and not as a ſerious production.

(B) This matter has been ſet in a clear light by the writer of the following letter.

“ SIR,

“ We are informed by Sir John Hawkins, that Dr Johnſon dictated from memory that account of the perſon vulgarly named *the Admirable Crichton*, which is to be found in one of the papers of the Adventurer.

“ That account is plainly an abridgement of the life of Crichton by Dr George Mackenzie. Dr Mackenzie ſuppoſes that Paſquier, the French lawyer and antiquary, was an eye-witneſs of the feats performed in arts as well as in arms by Crichton. This is one of the groſſeſt errors in biography which has occurred to me in the courſe of my reading; and it is an error which I perceive is gaining ground daily, and bids fair in a ſhort time to be received as an indiſputable truth.

“ The

Paris had been true, no man was more likely to be acquainted with them than Stephen Paſquier, who lived at the time, and who would be fond enough of recording tranſactions ſo extraordinary. It may farther be obſerved, that Thuanus, who was likewiſe a contemporary, and who in his own life is very particular in what relates to learned men, makes no mention of Crichton. The only authority for his having ever reſided in France at all (Sir Thomas Urquhart excepted) is that of Dr John Johnſton, who ſays *Gallia pectus excolit.* But this amounts to no proof of the truth of the tranſactions related by Urquhart. The whole which can be deduced from it is, that Crichton, in the courſe of his travels, might make ſome ſtay in France for the purpoſe of improvement. Even this, however, doth not agree with the narration of Imperialis, who informs us, that when troubles aroſe in Scotland on account of religion, and Queen Mary fell into ſo many calamities, Crichton was ſent by his father directly from that country to Venice as a place of ſecurity.

“ It is acknowledged by Sir John Hawkins, that Sir Thomas Urquhart has produced no authorities in ſupport of his ſurpriſing narrations. But this defect, Sir John thinks, is ſupplied in the Life of Crichton which is given in Mr Pennant's Tour. I am under the neceſſity of ſaying, that this is by no means the caſe. The article in Pennant was not drawn up by that ingenious and learned gentleman, but is the tranſcript of a pamphlet, that was printed ſome years ago at Aberdeen; and which pamphlet is nothing more than a republication, with a few verbal alterations, of the Life of Crichton written by Mackenzie. It doth not, therefore, furniſh a ſingle additional teſtimony in confirmation of Sir Thomas Urquhart's ſtories, excepting in the miſtaken inſtance from Paſquier. In other reſpects it only borrows facts from Sir Thomas Urquhart, without eſtabliſhing them upon freſh proofs. It is obſervable, that the earlier biographers of Crichton had no knowledge of moſt of the tranſactions enlarged upon by this extravagant writer; for if they had known them, they would have been eagerly diſpoſed to relate them, and to do it with every circumſtance of exaggeration. How much this was the character of Thomas Dempſter, with regard to his own countrymen, is ſufficiently underſtood, and hath frequently been remarked; and yet his account of Crichton is uncommonly modeſt, compared with thoſe of ſucceeding authors. The extravagance of Imperialis in reſpect to Crichton has already appeared. There ſeems indeed to have been an univerſal tendency in the writers of this young Scotſman's life to produce wonder and aſtoniſhment. Mackenzie remarks, that Imperialis could not but know the truth of all, or at leaſt of moſt of, the things he has related concerning Crichton, ſince he lived upon the places in which they were tranſacted, and had them from an eye and ear witneſs, even his own father. It is, however, to be remembered, that Imperialis's *Muſeum Hiſtoricum* was not publiſhed till 1640, nearly ſixty years after the events recorded by him happened; to which may be added, that the information he derived from his father was probably very imperfect. Imperialis the elder was not born till 1568, and conſequently was only thirteen years old when Crichton diſplayed his talents at Padua. What real dependence, therefore, could there be on the accuracy of the account given by a youth of that age? He could only relate, and perhaps from inadequate intelligence, the things which were talked of when he was a boy. Beſides, his authority is appealed to for no more than a ſingle fact, and that a doubtful one, ſince it does not accord with Manutius's narrative: and who ever heard of the famous philoſopher Archangelus Mercenarius?

“ The error ſeems to have ariſen from the following circumſtance: Dr Mackenzie had never read the original work of Paſquier, entitled *Recherches de la France;* what he quotes concerning *the wonderful young man* is taken from a Latin abridgement of that work; he refers to *Steph. Paſch.* Diſquiſ. lib. v. cap. 23. and he gives his quotation in Latin; indeed it does not appear that Dr Mackenzie had ever heard of the original work. Now Paſquier, inſtead of ſaying that he was an eye-witneſs of the wonders exhibited by Crichton, ſays in the moſt unequivocal terms, that what he relates was taken ‘ from a manuſcript which was occaſionally uſed by him,’ (*d'un livre ecrit à la main, dont je m' aide ſelon les occurrences*). And he adds, ‘ I will repreſent the ſtory in its own ſimple garb, without any artificial colouring, ſo that my readers may be the more inclined to give credit to it,’ (*vous repreſentant cette hiſtoire en ſa ſimplicitè, ſans y apporter aucun fard pour ce que vous y adjouſteres plus de foy*). He then tranſcribes the narrative from the MS. which places the appearance of this phenomenon in the year 1445, a full century before the birth of our Crichton. See *Recherches de la France*, lib. vi. c. 38. 39.

“ Dr Mackenzie, although he had not read the original of Paſquier, appears to have read an author who quotes the ſame ſtory: ‘ The learned M. du Launoy (ſays he, in his Hiſtory of the College of Navarre, finding the hiſtory of this diſpute recorded in a MS. Hiſtory of the College of Navarre, and the like account of a Spaniard in Trithemius, confounds the two together, and *robs* our author of the glory of this action, and places it in the year 1445; whereas it ſhould be in the year 1571.’ This charge of *robbery* is ſingular enough.

“ Let me only add, that Paſquier tranſcribes ſome verſes written by George Chaſtelain, a French poet in the reign of Charles VII. king of France, which allude to the ſame ſtory; and that Paſquier himſelf was born at Paris in 1528, paſſed his life in that city, and was an eminent lawyer and pleader in 1571; ſo that it is impoſſible the feats of Crichton, had they been really performed at Paris, could have been unknown to him, and moſt improbable that, knowing them, he would have omitted to mention them; for, in the ſame lib. vi. c. 39. he is at pains to produce examples of great proficiency, diſplayed by men in a much humbler rank of life than that of philoſophers and public diſputants. I am, &c. *”

* *Edin. Mag.* 1787.

“ The truth of the matter is, that ſome ſlight circumſtances excepted, neither Dempſter nor Imperialis have produced any evidences of Crichton's extraordinary abilities beſides thoſe which are recorded by the younger Aldus Manutius. He therefore is to be regarded as the only living authority upon the ſubject. Manutius was contemporary with Crichton; he was cloſely connected with him in friendſhip; and he relates ſeveral things on his own perſonal knowledge. He is a poſitive and undoubted witneſs with reſpect to our young Scotſman's intellectual and literary exertions at Venice and at Padua; and from him it is that our account of them is given above. Nevertheleſs, even Aldus Manutius is to be read with ſome degree of caution. Dedications are apt to aſſume the ſtyle of exaggeration, and this is the caſe with Manutius's dedication of the *Paradoxa Ciceronis* to Crichton. In addition to the general language of ſuch addreſſes, he might be carried too far by his affection for his friend, which appears to have been very great: nor was the younger Aldus eminent for ſteadineſs and conſiſtency of character. It is even ſaid that by his imprudencies he fell into contempt and miſery. But independently of any conſiderations of this kind, it may be obſerved, that Manutius's narrative, previous to Crichton's arrival at Venice, could not be derived from perſonal knowledge. For that part of it (which is ſufficiently erroneous) he was probably indebted to Crichton himſelf. Neither does he appear to have been an eye-witneſs of the whole of the diſputations which were held at Padua; for ſpeaking of his young friend's praiſe of ignorance, he relates, that thoſe who were preſent told him afterwards how much they were ſtruck with that oration. However, at the other diſputation, which laſted three days, Manutius ſeems certainly to have attended; for he concludes his accounts of it with ſaying, that he was not only the adviſer but the ſpectator of Crichton's wonderful conteſts. It is evident, however, from the dedication, that his extraordinary abilities were not univerſally acknowledged and admired. Some there were who detracted from them, and were diſpleaſed with Manutius for ſo warmly ſupporting his reputation.

“ As to the real cauſe and manner of our young Scotſman's death, both of them ſtill remain in ſome degree of obſcurity. That he was killed in a rencounter at the carnival at Mantua, is teſtified by too many authors to be reaſonably doubted. But whether there was that particular malignity on the part of Vincenzo di Gonzaga, which is commonly aſcribed to him, may be conſidered as uncertain.

“ One important method yet remains by which we may be enabled to form a judgment of Crichton's genius, and that is from a peruſal of the four poems of his which are ſtill preſerved. It is, however, to be feared, that theſe will not exhibit him in a very high point of view. Some fancy, perhaps, may be thought to be diſplayed in the longeſt of his poems, which was written on occaſion of his approach to the city of Venice. He there repreſents a Naiad as riſing up before him; and, by the order of the Muſes and of Minerva, directing him how to proceed. But this is a ſentiment which ſo eaſily preſents itſelf to a claſſical reader, that it can ſcarcely be conſidered as deſerving the name of a poetical invention. The three other poems of Crichton have ſtill leſs to recommend them. Indeed his verſes will not ſtand the teſt of a rigid examination even with regard to quantity.

What then is the opinion which on the whole we are to form of the admirable Crichton? It is evident that he was a youth of ſuch lively parts as excited great preſent admiration, and high expectation with regard to his future attainments. He appears to have had a fine perſon, to have been adroit in his bodily exerciſes, to have poſſeſſed a peculiar facility in learning languages, to have enjoyed a remarkably quick and retentive memory, and to have excelled in a power of declamation, a fluency of ſpeech, and a readineſs of reply. His knowledge, likewiſe, was probably very uncommon for his years; and this, in conjunction with his other qualities, enabled him to ſhine in public diſputation. But whether his knowledge and learning were accurate or profound, may juſtly be queſtioned; and it may equally be doubted whether he would have ariſen to any extraordinary degree of eminence in the literary world. It will always be reflected upon with regret, that his early and untimely death prevented this matter from being brought to the teſt of experiment.”

From the portraits which remain of Crichton, it appears that in his face and form he was beautiful and elegant, and that his body and limbs, though not muſcular or athletic, were well proportioned, and fitted for feats of agility. The following catalogue of Crichton's works is given by Dempſter: 1. *Odæ ad Laurentium Maſſam plures.* 2. *Laudes Patavinæ, Carmen extempore effuſum, cum in Jacobi Moyſii Cornelii domo experimentum ingenii coram tota Academiæ frequentia, non ſine multorum ſtupore, faceret.* 3. *Ignorationis Laudatio, extemporale Thema ibidem redditum, poſt ſex horarum diſputationes, ut præſentes ſomnia potius fovere quam rem ſe veram videre affirmarint, ait Manutius.* 4. *De Appulſu ſuo Venetias.* 5. *Odæ ad Aldum Manutium.* 6. *Epiſtolæ ad Diverſos.* 7. *Præfationes ſolemnes in omnes Scientias ſacras et profanes.* 8. *Judicium de Philoſophis.* 9. *Errores Ariſtotelis.* 10. *Arma an Literæ Præſtant, Contraverſia oratoria.* 11. *Refutatio Mathematicorum.* 12. A Comedy in the Italian language.

CRICK, among farriers, is when a horſe cannot turn his neck any manner of way, but holds it fore right, inſomuch that he cannot take his meat from the ground without great pain.

CRICKET. See GRYLLUS, ENTOMOLOGY *Index*.

CRICKET is alſo the name of an exerciſe or game, with bats and a ball.

Mole-CRICKET. See GRYLLOTALPA, ENTOMOLOGY *Index*.

CRICKLADE, a borough-town of Wiltſhire, ſituated on the river Iſis, about 26 miles ſouth-weſt of Oxford. It ſends two members to parliament. W. Long. 1. 55. N. Lat. 51. 35.

CRICOARYTENOIDÆUS, in *Anatomy*, a name given to two muſcles of the larynx. See ANATOMY, *Table of the Muſcles*.

CRICOIDES, in *Anatomy*, a cartilage of the larynx, called alſo the *annular cartilage*. It occupies the loweſt part by way of baſe to the reſt of the cartilages, and to the lower part of it the aſpera arteria adheres. See ANATOMY, *Table of the Muſcles*.

CRICOTHYROIDÆUS, in *Anatomy*, one of the five proper muſcles of the larynx. See ANATOMY, *Table of the Muſcles*.

CRIM-TARTARS, a people of Aſia, ſo called becauſe they originally came from Crimea. They rove from place to place in ſearch of paſtures, their houſes being drawn on carts. There are a great number of them about Aſtrachan, to which place they flock in the winter-time; but they are not permitted to enter the city: for this reaſon, they erect huts up and down in the open fields: which are made either of bulruſhes or reeds, being about 12 feet in diameter, of a round form, and with a hole at the top to let out the ſmoke. Their fuel is turf or cow-dung; and when the weather is very cold, they cover the hut with a coarſe cloth, and ſometimes paſs ſeveral days without ſtirring out. They are generally of ſmall ſtature, with large faces, little eyes, and of an olive complexion. The men are generally ſo wrinkled in their faces, that they look like old women. Their common food is fiſh dried in the ſun, which ſerves them inſtead of bread; and they eat the fleſh of horſes as well as camels. Their drink is water and milk, eſpecially mares milk, which they carry about in naſty leathern bags. Their garments are of coarſe gray cloth, with a looſe mantle made of a black ſheep's ſkin, and a cap of the ſame. The women are clothed in white linen, with which likewiſe they dreſs their heads, hanging a great many Moſcovian pence about them; and there is likewiſe a hole left to ſtick feathers in. As for their religion, they are a ſort of Mahometans; but do not coop up their women like the Turks.

Crim-Tartary, or *Crimea*. See CRIMEA.

CRIME *and* PUNISHMENT. The diſcuſſion and admeaſurement of crimes and puniſhments forms in every country the code of criminal law; or, as it is more uſually denominated in England, the doctrine of the *pleas of the crown;* ſo called, becauſe the king, in whom centres the majeſty of the whole community, is ſuppoſed by the law to be the perſon injured by every infraction of the public rights belonging to that community; and is therefore in all caſes the proper proſecutor for every public offence.

The knowledge of this branch of juriſprudence, which teaches the nature, extent, and degrees of every crime, and adjuſts to it its adequate and neceſſary penalty, is of the utmoſt importance to every individual in the ſtate. For no rank or elevation in life, no uprightneſs of heart, no prudence or circumſpection of conduct, ſhould tempt a man to conclude, that he may not at ſome time or other be deeply intereſted in theſe reſearches. The infirmities of the beſt among us, the vices and ungovernable paſſions of others, the inſtability of all human affairs, and the numberleſs unforeſeen events which the compaſs of a day may bring forth, will teach us (upon a moment's reflection), that to know with preciſion what the laws of our country have forbidden, and the deplorable conſequences to which a wilful diſobedience may expoſe us, is a matter of univerſal concern.

In proportion to the importance of the criminal law, ought alſo to be the care and attention of the legiſlature in properly forming and enforcing it. It ſhould be founded upon principles that are permanent, uniform, and univerſal; and always conformable to the dictates of truth and juſtice, the feelings of humanity, and the indelible rights of mankind: though it ſometimes (provided there be no tranſgreſſion of theſe eternal boundaries) may be modified, narrowed, or enlarged, according to the local or occaſional neceſſities of the ſtate which it is meant to govern. And yet, either from a want of attention to theſe principles in the firſt concoction of the laws, and adopting in their ſtead the impetuous dictates of avarice, ambition, and revenge; from retaining the diſcordant political regulations, which ſucceſſive conquerors or factions have eſtabliſhed, in the various revolutions of government; from giving a laſting efficacy to ſanctions that were intended to be temporary, and made (as Lord Bacon expreſſes it) merely upon the ſpur of the occaſion; or laſtly, from too haſtily employing ſuch means as are greatly diſproportionate to their ends, in order to check the progreſs of ſome very prevalent offence;—from ſome, or from all, of theſe cauſes, it hath happened, that the criminal law is in every country of Europe more rude and imperfect than the civil. We ſhall not here enter into any minute inquiries concerning the local conſtitutions of other nations; the inhumanity and miſtaken policy of which have been ſufficiently pointed out by ingenious writers of their own *. But even with us in Britain, where our crown-law is with juſtice ſuppoſed to be more nearly advanced to perfection; where crimes are more accurately defined, and penalties leſs uncertain and arbitrary; where all our accuſations are public, and our trials in the face of the world; where torture is unknown, and every delinquent is judged by ſuch of his equals, againſt whom he can form no exception, or even a perſonal diſlike:—even here we ſhall occaſionally find room to remark ſome particulars that ſeem to want reviſion and amendment. Theſe have chiefly ariſen from too ſcrupulous an adherence to ſome rules of the ancient common law, when the reaſons have ceaſed upon which thoſe rules were founded; from not repealing ſuch of the old penal laws as are either obſolete or abſurd; and from too little care and attention in framing and paſſing new ones. The enacting of penalties to which a whole nation ſhall be ſubject, ought not to be left, as a matter of indifference, to the paſſions or intereſts of a few, who upon temporary motives may prefer or ſupport ſuch a bill; but be calmly and maturely conſidered by perſons who know what proviſions the laws have already made to remedy the miſchief complained of, who can from experience foreſee the probable conſequences of thoſe which are now propoſed, and who will judge without paſſion or prejudice how adequate they are to the evil. It is never uſual in the houſe of peers even to read a private bill which may affect the property of an individual, without firſt referring it to ſome of the learned judges, and hearing their report thereon. And ſurely equal precaution is neceſſary, when laws are to be eſtabliſhed which may affect the property, the liberty, and perhaps even the lives of thouſands. Had ſuch a reference taken place, it is impoſſible that in the 16th century it could ever have been made a capital crime, to break down (however maliciouſly) the mound of a fiſhpond, whereby any fiſh ſhall eſcape; or to cut down a cherry-tree in an orchard. Were even a committee appointed

Blackſtone's Comment.

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* As Baron Monteſquieu, Marquis of Beccaria, &c.

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pointed but once in 100 years to reviſe the criminal law, it could not have continued to this hour a felony without benefit of clergy, to be ſeen for one month in the company of perſons who call themſelves, or are called, *Egyptians*.

It is true, that theſe outrageous penalties, being ſeldom or never inflicted, are hardly known to be the law by the public; but that rather aggravates the miſchief, by laying a ſnare for the unwary. Yet they cannot but occur to the obſervation of any one, who hath undertaken the taſk of examining the great outlines of our law, and tracing them up to their principles: and it is the duty of ſuch a one to hint them with decency to thoſe whoſe abilities and ſtations enable them to apply the remedy. We now proceed to conſider (in the firſt place) the general nature of *crimes*.

I. A crime, or miſdemeanour, is an act committed, or omitted, in violation of a public law, either forbidding or commanding it. This general definition comprehends both crimes and miſdemeanours; which, properly ſpeaking, are mere ſynonymous terms; though, in common uſage, the word "crimes" is made to denote ſuch offences as are of a deeper and more atrocious dye; while ſmaller faults, and omiſſions of leſs conſequence, are compriſed under the gentler name of "miſdemeanours" only.

The diſtinction of public wrongs from private, of crimes and miſdemeanours from civil injuries, ſeems principally to conſiſt in this: that private wrongs, or civil injuries, are an infringement or privation of the civil rights which belong to individuals, conſidered merely as individuals; public wrongs, or crimes and miſdemeanours, are a breach and violation of the public rights and duties, due to the whole community, conſidered as a community, in its ſocial aggregate capacity. As if I detain a field from another man, to which the law has given him a right, this is a civil injury, and not a crime; for here only the right of an individual is concerned, and it is immaterial to the public which of us is in poſſeſſion of the land; but treaſon, murder, and robbery, are properly ranked among crimes; ſince, beſides the injury done to individuals, they ſtrike at the very being of ſociety; which cannot poſſibly ſubſiſt, where actions of this ſort are ſuffered to eſcape with impunity.

In all caſes the crime includes an injury; every public offence is alſo a private wrong, and ſomewhat more; it affects the individual, and it likewiſe affects the community. Thus treaſon in imagining the king's death, involves in it conſpiracy againſt an individual, which is alſo a civil injury; but as this ſpecies of treaſon in its conſequences principally tends to the diſſolution of government, and the deſtruction thereby of the order and peace of ſociety, this denominates it a crime of the higheſt magnitude. Murder is an injury to the life of an individual; but the law of ſociety conſiders principally the loſs which the ſtate ſuſtains by being deprived of a member, and the pernicious example thereby ſet for others to do the like. Robbery may be conſidered in the ſame view: it is an injury to private property; but, were that all, a civil ſatisfaction in damages might atone for it; the public miſchief is the thing, for the prevention of which our laws have made it a capital offence. In theſe groſs and atrocious injuries the private wrong is ſwallowed up in the public; we ſeldom hear any mention made of ſatisfaction to the individual; the ſatisfaction to the community being ſo very great. And indeed, as the public crime is not otherwiſe avenged than by forfeiture of life and property, it is impoſſible afterwards to make any reparation for the private wrong; which can only be had from the body or goods of the aggreſſor. But there are crimes of an inferior nature, in which the public puniſhment is not ſo ſevere, but it affords room for a private compenſation alſo; and herein the diſtinction of crimes from civil injuries is very apparent. For inſtance, in the caſe of battery, or beating another, the aggreſſor may be indicted for this at the ſuit of the king, for diſturbing the public peace, and be puniſhed criminally by fine and impriſonment; and the party beaten may alſo have his private remedy by action of treſpaſs for the injury, which he in particular ſuſtains, and recover a civil ſatisfaction in damages. So alſo, in caſe of a public nuiſance, as digging a ditch acroſs a highway, this is puniſhable by indictment, as a common offence to the whole kingdom, and all his majeſty's ſubjects: but if any individual ſuſtains any ſpecial damage thereby, as laming his horſe, breaking his carriage, or the like, the offender may be compelled to make ample ſatisfaction, as well for the private injury as for the public wrong.

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II. The nature of crimes and miſdemeanours in general being thus aſcertained and diſtinguiſhed, we proceed in the next place to conſider the general nature of puniſhments: Which are evils or inconveniences conſequent upon crimes and miſdemeanours; being deviſed, denounced, and inflicted by human laws, in conſequence of diſobedience or miſbehaviour in thoſe to regulate whoſe conduct ſuch laws were reſpectively made. And herein we will briefly conſider the *power*, the *end*, and the *meaſure*, of human puniſhment.

1. As to the power of human puniſhment, or the right of the temporal legiſlator to inflict diſcretionary penalties for crimes and miſdemeanours. It is clear, that the right of puniſhing crimes againſt the law of nature, as murder and the like, is in a ſtate of mere nature, veſted in every individual. For it muſt be veſted in ſomebody; otherwiſe the laws of nature would be vain and fruitleſs, if none were empowered to put them in execution; and if that power is veſted in any one, it muſt alſo be veſted in all mankind; ſince all are by nature equal. Whereof the firſt murderer Cain was ſo ſenſible, that we find him expreſſing his apprehenſions, that whoever ſhould find him would ſlay him. In a ſtate of ſociety this right is transferred from individuals to the ſovereign power; whereby men are prevented from being judges in their own cauſes, which is one of the evils that civil government was intended to remedy. Whatever power therefore individuals had of puniſhing offences againſt the law of nature, that is now veſted in the magiſtrate alone; who bears the ſword of juſtice by the conſent of the whole community. And to this precedent natural power of individuals muſt be referred that right, which ſome have argued to belong to every ſtate (though, in fact, never exerciſed by any), of puniſhing not only their own ſubjects, but alſo foreign

ambaſſadors, even with death itſelf; in caſe they have offended, not indeed againſt the municipal laws of the country, but againſt the divine laws of nature, and become liable thereby to forfeit their lives for their guilt.

As to offences merely againſt the laws of ſociety, which are only *mala prohibita*, and not *mala in ſe;* the temporal magiſtrate is alſo impowered to inflict coercive penalties for ſuch tranſgreſſion: and this by the conſent of individuals; who, in forming ſocieties, did either tacitly or expreſsly inveſt the ſovereign power with a right of making laws, and of enforcing obedience to them when made, by exerciſing, upon their non-obſervance, ſeverities adequate to the evil. The lawfulneſs, therefore, of puniſhing ſuch criminals is founded upon this principle, that the law by which they ſuffer was made by their own conſent; it is a part of the original contract into which they entered, when firſt they engaged in ſociety; it was calculated for, and has long contributed to, their own ſecurity.

This right therefore, being thus conferred by univerſal conſent, gives to the ſtate exactly the ſame power, and no more, over all its members, as each individual member had naturally over himſelf or others; which has occaſioned ſome to doubt, how far a human legiſlature ought to inflict capital puniſhments for poſitive offences; offences againſt the municipal law only, and not againſt the law of nature; ſince no individual has naturally a power of inflicting death upon himſelf or others for actions in themſelves indifferent. With regard to offences *mala in ſe*, capital puniſhments are in ſome inſtances inflicted by the immediate command of God himſelf to all mankind; as, in the caſe of murder, by the precept delivered to Noah, their common anceſtor and repreſentative, "Whoſo ſheddeth man's blood, by man ſhall his blood be ſhed." In other inſtances they are inflicted after the example of the Creator, in his poſitive code of laws for the regulation of the Jewiſh republic; as in the caſe of the crime againſt nature. But they are ſometimes inflicted without ſuch expreſs warrant or example, at the will and diſcretion of the human legiſlature; as for forgery, for theft, and ſometimes for offences of a lighter kind. The practice is thus juſtified by that great and good man Sir Matthew Hale: "When offences grow enormous, frequent, and dangerous to a kingdom, or ſtate, deſtructive or highly pernicious to civil ſocieties, and to the great inſecurity and danger of the kingdom or its inhabitants, ſevere puniſhment and even death itſelf is neceſſary to be annexed to laws in many caſes by the prudence of lawgivers.[v] It is therefore the enormity, or dangerous tendency, of the crime, that alone can warrant any earthly legiſlature in putting him to death that commits it. It is not its frequency only, or the difficulty of otherwiſe preventing it, that will excuſe our attempting to prevent it by a wanton effuſion of human blood. For though the end of puniſhment is to deter men from offending, it never can follow from thence, that it is lawful to deter them at any rate and by any means; ſince there may be unlawful methods of enforcing obedience even to the juſteſt laws. Every humane legiſlator will be therefore extremely cautious of eſtabliſhing laws that inflict the penalty of death, eſpecially for ſlight offences, or ſuch as are merely poſitive. He will expect a better reaſon for his ſo doing than that looſe one which generally is given; that it is found by former experience that no lighter penalty will be effectual. For is it found upon farther experience, that capital puniſhments are more effectual? Was the vaſt territory of all the Ruſſias worſe regulated under the late empreſs Elizabeth, than under her more ſanguinary predeceſſors? Is it now, under Catharine II. leſs civilized, leſs ſocial, leſs ſecure? And yet we are aſſured, that neither of theſe illuſtrious princeſſes have, throughout their whole adminiſtration, inflicted the penalty of death: and the latter has, upon full perſuaſion of its being uſeleſs, nay even pernicious, given orders for aboliſhing it entirely throughout her extenſive dominions. But indeed, were capital puniſhments proved by experience to be a ſure and effectual remedy, that would not prove the neceſſity (upon which the juſtice and propriety depend) of inflicting them upon all occaſions when other expedients fail. It is feared this reaſoning would extend a great deal too far. For inſtance, the damage done to our public roads by loaded waggons is univerſally allowed, and many laws have been made to prevent it, none of which have hitherto proved effectual. But it does not therefore follow, that it would be juſt for the legiſlature to inflict death upon every obſtinate carrier, who defeats or eludes the proviſions of former ſtatutes. Where the evil to be prevented is not adequate to the violence of the preventive, a ſovereign that thinks ſeriouſly can never juſtify ſuch a law to the dictates of conſcience and humanity. To ſhed the blood of our fellow creature is a matter that requires the greateſt deliberation, and the fulleſt conviction of our own authority; for life is the immediate gift of God to man; which neither he can reſign, nor can it be taken from him, unleſs by the command or permiſſion of Him who gave it, either expreſsly revealed, or collected from the laws of nature or ſociety by clear and indiſputable demonſtration.

We would not be underſtood to deny the right of the legiſlature in any country to enforce its own laws by the death of the tranſgreſſor, though perſons of ſome abilities have doubted it; but only to ſuggeſt a few hints for the conſideration of ſuch as are, or may hereafter become, legiſlators. When a queſtion ariſes, whether death may be lawfully inflicted for this or that tranſgreſſion. the wiſdom of the laws muſt decide it: and to this public judgment or deciſion all private judgments muſt ſubmit; elſe there is an end of the firſt principle of all ſociety and government. The guilt of blood, if any, muſt lie at their doors, who miſinterpret the extent of their warrant; and not at the doors of the ſubject, who is bound to receive the interpretations that are given by the ſovereign power.

2. As to the end, or final cauſe, of human puniſhments. This is not by way of atonement or expiation for the crime committed; for that muſt be left to the juſt determination of the Supreme Being; but as a precaution againſt future offences of the ſame kind. This is effected three ways: either by the amendment of the offender himſelf: for which purpoſe all corporeal puniſhments, fines, and temporary exile or impriſonment, are inflicted; or, by deterring others by the dread of his example from offending in the like way, "*ut pœna* (as Tully expreſſes it) *ad paucos, me-*

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“ *ius ad omnes, perveniat* ;” which gives riſe to all ignominious puniſhments, and to ſuch executions of juſtice as are open and public: or, laſtly, by depriving the party injuring of the power to do future miiſchief; which is effected by either putting him to death, or condemning him to perpetual confinement, ſlavery, or exile. The ſame one end, of preventing future crimes, is endeavoured to be anſwered by each of theſe three ſpecies of puniſhment. The public gains equal ſecurity, whether the offender himſelf be amended by wholeſome correction, or whether he be diſabled from doing any farther harm: and if the penalty fails of both theſe effects, as it may do, ſtill the terror of his example remains as a warning to other citizens. The method, however, of inflicting puniſhment ought always to be proportioned to the particular purpoſe it is meant to ſerve, and by no means to exceed it; therefore the pains of death, and perpetual diſability by exile, ſlavery, or impriſonment, ought never to be inflicted, but when the offender appears incorrigible: which may be collected either from a repetition of minuter offences; or from the perpetration of ſome one crime of deep malignity, which of itſelf demonſtrates a diſpoſition without hope or probability of amendment: and in ſuch caſes it would be cruelty to the public to defer the puniſhment of ſuch a criminal till he had an opportunity of repeating perhaps the worſt of villanies.

3. As to the *meaſure* of human puniſhments. From what has been obſerved in the former articles, we may collect, that the quantity of puniſhment can never be abſolutely determined by any ſtanding invariable rule; but it muſt be left to the arbitration of the legiſlature to inflict ſuch penalties as are warranted by the laws of nature and ſociety, and ſuch as appear to be the beſt calculated to anſwer the end of precaution againſt future offences.

Hence it will be evident, that what ſome have ſo highly extolled for its equity, the *lex talionis*, or “ law of retaliation,” can never be in all caſes an adequate or permanent rule of puniſhment. In ſome caſes indeed it ſeems to be dictated by natural reaſon; as in the caſe of conſpiracies to do an injury, or falſe accuſations of the innocent; to which we may add that law of the Jews and Egyptians, mentioned by Joſephus and Diodorus Siculus, that whoever without ſufficient cauſe was found with any mortal poiſon in his cuſtody, ſhould himſelf be obliged to take it. But, in general, the difference of perſons, place, time, provocation, or other circumſtances, may enhance or mitigate the offence; and in ſuch caſes retaliation can never be a proper meaſure of juſtice. If a nobleman ſtrikes a peaſant, all mankind will ſee, that if a court of juſtice awards a return of the blow, it is more than a juſt compenſation. On the other hand, retaliation may ſometimes be too eaſy a ſentence; as, if a man maliciouſly ſhould put out the remaining eye of him who had loſt one before, it is too ſlight a puniſhment for the maimer to loſe only one of his: and therefore the law of the Locrians, which demanded an eye for an eye, was in this inſtance judiciouſly altered; by decreeing, in imitation of Solon's laws, that he who ſtruck out the eye of a one-eyed man, ſhould loſe both his own in return. Beſides, there are very many crimes, that will in no ſhape admit of theſe penalties, without manifeſt abſurdity and wickedneſs. Theft cannot be puniſhed by theft, defamation by defamation, forgery by forgery, adultery by adultery, and the like. And we may add, that thoſe inſtances, wherein retaliation appears to be uſed, even by the divine authority, do not really proceed upon the rule of exact retribution, by doing to the criminal the ſame hurt he has done to his neighbour, and no more; but this correſpondence between the crime and puniſhment is barely a conſequence from ſome other principle. Death is ordered to be puniſhed with death; not becauſe one is equivalent to the other, for that would be expiation, and not puniſhment. Nor is death always an equivalent for death: the execution of a needy decrepid aſſaſſin is a poor ſatisfaction for the death of a nobleman in the bloom of his youth, and full enjoyment of his friends, his honours, and his fortune. But the reaſon upon which this ſentence is grounded ſeems to be, that this is the higheſt penalty that man can inflict, and tends moſt to the ſecurity of the world: by removing one murderer from the earth, and ſetting a dreadful example to deter others: ſo that even this grand inſtance proceeds upon other principles than thoſe of retaliation. And truly, if any meaſure of puniſhment is to be taken from the damage ſuſtained by the ſufferer, the puniſhment ought rather to exceed than equal the injury; ſince it ſeems contrary to reaſon and equity, that the guilty (if convicted) ſhould ſuffer no more than the innocent has done before him; eſpecially as the ſuffering of the innocent is paſt and irrevocable, that of the guilty is future, contingent, and liable to be eſcaped or evaded. With regard indeed to crimes that are incomplete, which conſiſt merely in the intention, and are not yet carried into act, as conſpiracies and the like; the innocent has a chance to fruſtrate or avoid the villany, as the conſpirator has alſo a chance to eſcape his puniſhment: and this may be one reaſon why the *lex talionis* is more proper to be inflicted, if at all, for crimes that conſiſt in intention, than for ſuch as are carried into act. It ſeems indeed conſonant to natural reaſon, and has therefore been adopted as a maxim by ſeveral theoretical writers, that the puniſhment, due to the crime of which one falſely accuſes another, ſhould be inflicted on the perjured informer. Accordingly, when it was once attempted to introduce into England the law of retaliation, it was intended as a puniſhment for ſuch only as preferred malicious accuſations againſt others; it being enacted by ſtatute 37 Edw. III. c. 18. that ſuch as preferred any ſuggeſtions to the king's great council ſhould put in ſureties of taliation; that is, to incur the ſame pain that the other ſhould have had, in caſe the ſuggeſtion were found untrue. But, after one year's experience, this puniſhment of taliation was rejected, and impriſonment adopted in its ſtead.

But though from what has been ſaid it appears, that there cannot be any regular determinate method of rating the quantity of puniſhments for crimes, by any one uniform rule; but they muſt be referred to the will and diſcretion of the legiſlative power: yet there are ſome general principles, drawn from the nature and circumſtances of the crime, that may be of ſome aſſiſtance in alloting it an adequate puniſhment.

As, firſt, with regard to the object of it: for the greater and more exalted the object of an injury is, the more care ſhould be taken to prevent that injury, and of courſe under this aggravation the puniſhment ſhould be more ſevere. Therefore treaſon in conſpiring the king's death is (in Britain) puniſhed with greater rigour than even actually killing any private ſubject. And yet, generally, a deſign to tranſgreſs is not ſo flagrant an enormity as the actual completion of that deſign. For evil, the nearer we approach it, is the more diſagreeable and ſhocking: ſo that it requires more obſtinacy in wickedneſs to perpetrate an unlawful action, than barely to entertain the thought of it: and it is an encouragement to repentance and remorſe, even till the laſt ſtage of any crime, that it never is too late to retract; and that if a man ſtops even here, it is better for him than if he proceeds: for which reaſons an attempt to rob, to raviſh, or to kill, is far leſs penal than the actual robbery, rape, or murder. But in the caſe of a treaſonable conſpiracy, the object whereof is the king's majeſty, the bare intention will deſerve the higheſt degree of ſeverity: not becauſe the intention is equivalent to the act itſelf; but becauſe the greateſt rigour is no more than adequate to a treaſonable purpoſe of the heart, and there is no greater left to inflict upon the actual execution itſelf.

Again, The violence of paſſion, or temptation, may ſometimes alleviate a crime; as theft, in caſe of hunger, is far more worthy of compaſſion, than when committed through avarice, or to ſupply one in luxurious exceſſes. To kill a man upon ſudden and violent reſentment is leſs penal than upon cool deliberate malice. The age, education, and character, of the offender; the repetition (or otherwiſe) of the offence; the time, the place, the company wherein it was committed; all theſe, and a thouſand other incidents, may aggravate or extenuate the crime (A).

Farther, As puniſhments are chiefly intended for the prevention of future crimes, it is but reaſonable that among crimes of different natures thoſe ſhould be moſt ſeverely puniſhed, which are the moſt deſtructive of the public ſafety and happineſs; and, among crimes of an equal malignity, thoſe which a man has the moſt frequent and eaſy opportunities of committing, which cannot be ſo eaſily guarded againſt as others, and which therefore the offender has the ſtrongeſt inducement to commit: according to what Cicero obſerves, *Ea ſunt animadvertenda peccata maxime, quæ difficillime præcaventur*. Hence it is, that for a ſervant to rob his maſter is in more caſes capital than for a ſtranger. If a ſervant kills his maſter, it is a ſpecies of treaſon; in another it is only murder. To ſteal a handkerchief, or other trifle of above the value of twelvepence, privately from one's perſon, is made capital; but to carry off a load of corn from an open field, though of fifty times greater value, is puniſhed with tranſportation only. And in the iſland of Man this rule was formerly carried ſo far, that to take away a horſe or an ox was there no felony, but a treſpaſs, becauſe of the difficulty in that little territory to conceal them or carry them off: but to ſteal a pig or a fowl, which is eaſily done, was a capital miſdemeanour, and the offender was puniſhed with death.

Laſtly, As a concluſion to the whole, we may obſerve, that puniſhments of unreaſonable ſeverity, eſpecially when indiſcriminately inflicted, have leſs effect in preventing crimes, and amending the manners of a people, than ſuch as are more merciful in general, yet properly intermixed with due diſtinctions of ſeverity. It is the ſentiment of an ingenious writer, who ſeems to have well ſtudied the ſprings of human action, that crimes are more effectually prevented by the certainty than by the ſeverity of puniſhment: for the exceſſive ſeverity of laws (ſays Monteſquieu) hinders their execution. When the puniſhment ſurpaſſes all meaſure, the public will frequently prefer impunity to it. Thus alſo the ſtatute 1 Mar. ſt. 1. c. 1. recites in its preamble, "that the ſtate of every king conſiſts more aſſuredly in the love of the ſubjects towards their prince, than in the dread of laws made with rigorous pains: and that laws made for the preſervation of the commonwealth without great penalties, are more often obeyed and kept than laws made with extreme puniſhments." Happy had it been for the nation if the ſubſequent practice of that deluded princeſs in matters of religion, had been correſpondent to theſe ſentiments of herſelf and parliament in matters of ſtate and government! We may further obſerve, that ſanguinary laws are a bad ſymptom of the diſtemper of any ſtate, or at leaſt of its weak conſtitution. The laws of the Roman kings, and the twelve tables of the *decemviri*, were full of cruel puniſhments: the Porcian law, which exempted all citizens from ſentence of death, ſilently abrogated them all. In this period the republic flouriſhed: under the emperors ſevere puniſhments were revived, and then the empire fell.

It is, moreover, abſurd and impolitic to apply the ſame puniſhment to crimes of different malignity. A multitude of ſanguinary laws, (beſides the doubt that may be entertained concerning the right of making them) do likewiſe prove a manifeſt defect either in the wiſdom of the legiſlative, or the ſtrength of the executive, power. It is a kind of quackery in government, and argues a want of ſolid ſkill, to apply the ſame univerſal remedy, the *ultimum ſupplicium*, to every caſe of difficulty. It is, it muſt be owned, much eaſier to extirpate than to amend mankind; yet that magiſtrate muſt be eſteemed both a weak and a cruel ſurgeon who cuts off every limb which through ignorance or indolence he will not attempt to cure. It has been therefore ingeniouſly propoſed, that in every ſtate a ſcale of crimes ſhould be formed, with a correſponding ſcale of puniſhments, deſcending from the greateſt to the leaſt. But if that be too romantic an idea, yet at leaſt a wiſe legiſlator will mark the principal diviſions, and not aſſign penalties of the firſt degree to offences of an inferior rank. Where men ſee no diſtinction

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(A) Thus Demoſthenes (in his oration againſt Midas) finely works up the aggravations of the inſults he had received. "I was abuſed (ſays he) by my enemy, in cold blood, out of malice, not by heat of wine, in "the morning, publicly, before ſtrangers as well as citizens; and that in the temple, whither the duty of my "office called me."

tion made in the nature and gradations of puniſhment, the generality will be led to conclude there is no diſtinction in the guilt. Thus in France the puniſhment of robbery, either with or without murder, is the ſame: hence it is, that though perhaps they are therefore ſubject to fewer robberies, yet they never rob but they alſo murder. In China murderers are cut to pieces, and robbers not: hence in that country they never murder on the highway, though they often rob. And in Britain, beſides the additional terrors of a ſpeedy execution, and a ſubſequent expoſure or diſſection, robbers have a hope of tranſportation, which ſeldom is extended to murderers. This has the ſame effect here as in China, in preventing frequent aſſaſſination and ſlaughter.

Yet though in this inſtance we may glory in the wiſdom of our law, we ſhall find it more difficult to juſtify the frequency of capital puniſhment to be found therein; inflicted (perhaps inattentively) by a multitude of ſucceſſive independent ſtatutes, upon crimes very different in their natures. It is a melancholy truth, that, among the variety of actions which men are daily liable to commit, no leſs than 160 have been declared by act of parliament to be felonies without benefit of clergy; or, in other words, to be worthy of inſtant death. So dreadful a liſt, inſtead of diminiſhing, increaſes the number of offenders. The injured, through compaſſion, will often forbear to proſecute; juries, through compaſſion, will ſometimes forget their oaths, and either acquit the guilty or mitigate the nature of the offence; and judges, through compaſſion, will reſpite one half of the convicts, and recommend them to the royal mercy. Among ſo many chances of eſcaping, the needy and hardened offender overlooks the multitude that ſuffer: he boldly engages in ſome deſperate attempt to relieve his wants or ſupply his vices; and if, unexpectedly, the hand of juſtice overtakes him, he deems himſelf peculiarly unfortunate in falling at laſt a ſacrifice to thoſe laws which long impunity has taught him to contemn.

As to the trials and mode of puniſhment, ſee ARRAIGNMENT; TRIAL, and the references therefrom; CONVICTION; JUDGMENT; ATTAINDER; *CORRUPTION of Blood*; FORFEITURE; EXECUTION; the ſeveral *Crimes* under their reſpective names. See LAW *Index*.

Perſons capable or incapable of committing CRIMES; or (which is all one) of ſuffering the cenſures of the law upon the commiſſion of forbidden acts.

All the ſeveral pleas and excuſes which protect the committer of a forbidden act from the puniſhment which is otherwiſe annexed thereto, may be reduced to this ſingle conſideration, the want or defect of *will*. An involuntary act, as it has no claim to merit, ſo neither can it induce any guilt: the concurrence of the will, when it has its choice either to do or to avoid the fact in queſtion, being the only thing that renders human actions either praiſeworthy or culpable. Indeed, to make a complete crime, cognizable by human laws, there muſt be both a will and an act. For though, *in foro conſcientiæ*, a fixed deſign or will to do an unlawful act is almoſt as heinous as the commiſſion of it; yet as no temporal tribunal can ſearch the heart, or fathom the intentions of the mind, otherwiſe than as they are demonſtrated by outward actions, it therefote cannot puniſh for what it cannot know. For which reaſon, in all temporal juriſdictions, an *overt* act, or ſome open evidence of an intended crime, is neceſſary in order to demonſtrate the depravity of the will, before the man is liable to puniſhment. And as a vicious will without a vicious act is no civil crime; ſo, on the other hand, an unwarrantable act without a vicious will is no crime at all. So that to conſtitute a crime againſt human laws, there muſt be, firſt, a vicious will; and, ſecondly, an unlawful act conſequent upon ſuch vicious will.

Now there are three caſes in which the will does not join with the act: 1. When there is a defect of underſtanding. For where there is no diſcernment, there is no choice; and, where there is no choice, there can be no act of the will, which is nothing elſe but a determination of one's choice to do or abſtain from a particular action; he, therefore, that has no underſtanding, can have no will to guide his conduct. 2. Where there is underſtanding and will ſufficient reſiding in the party, but not called forth and exerted at the time of the action done; which is the caſe of all offences committed by chance or ignorance. Here the will ſits neuter, and neither concurs with the act nor diſagrees to it. 3. Where the action is conſtrained by ſome outward force and violence. Here the will counteracts the deed; and is ſo far from concurring with, that it loaths and diſagrees to what the man is obliged to perform. Infancy, idiocy, lunacy, and intoxication, fall under the firſt claſs; miſfortune and ignorance may be referred to the ſecond; and compulſion or neceſſity may properly rank in the third. See INFANCY, IDIOCY, DRUNKENNESS, MISFORTUNE, IGNORANCE, NECESSITY.

CRIMEA, or CRIM TARTARY, anciently the *Cherſoneſus Taurica*, a peninſula ſituated directly to the ſouth of St Peterſburg, between the 51ſt and 55th degrees of latitude, and in 46 longitude. Its ſouthern and weſtern coaſts lie on the Euxine, its northern and eaſtern on the Rotten ſea and the Palus Mæotis. It is joined, however, to the continent on the north by a ſmall neck of land not more than ſix miles broad. This peninſula has been known more than 3000 years ſince the firſt naval expedition of the Argonauts; a ſtory, though mixed with fable, yet well founded in its principal facts. The mountainous parts were inhabited by the Tauri, probably a colony of Scythians; and its coaſts on the weſt, the eaſt, and the ſouth, by Greeks. The Scythians were driven out by Mithridates; the Greeks by the Sarmatians; and theſe again by the Alani and Goths, a northern horde of Scythians. The Hungarians, the Coſſacks and Tartars, ſucceeded in their turn; while the Genoeſe, in the 12th century, held a temporary and precarious poſſeſſion of the ſeaports, which they were obliged to yield to the Turks in 1475. At the peace of 1774, the Tartars of the Crimea were declared independent; and in 1783, this peninſula was united to the Ruſſian empire.

From the above-mentioned iſthmus, on which is built the fortreſs of Or-kapi or Perekop, to the firſt riſing of the hill at Karaſubaſar, the country is one continued flat; elevating itſelf, by an eaſy gradation, to the ſummit of the hill, which forms the ſouth ſide of the peninſula and the ſhore of the Euxine ſea. The ſurface of the ſoil is almoſt all of one kind, a reddiſh-gray loam; on digging, you find it more or leſs mixed with a black earth, and the hills abound with marle. The whole flat from Perekop to the river Salgir, which may be an extent of 80 miles, is full of ſalt marſhes and lakes; from whence the neighbouring Ruſſian governments, as well as the Crim itſelf, Anatolia, and Beſſarabia, are ſupplied with ſalt. The moſt remarkable of theſe lakes are five in number; Koſlof and Keffa, ſo called after the towns near which they lie, are very large; the Tuſla, about 15 verſts from Perekop, on the road from Keffa; the Red lake, nor far from the laſt mentioned; and the Black lake. Beſides theſe, there are many other ſwamps and lakes, from whence the inhabitants get ſalt for their own conſumption.

The greateſt part of the peninſula is ſo level that a man may travel over the half of it without meeting with a river, or even the ſmalleſt brook. The inhabitants of the villages, therefore, make a pit in the yard of every houſe for receiving the rain or the water that runs from the hills. The whole tract is bare of every kind of tree. Not a buſh or a bramble is to be ſeen, and the herbage is extremely ſcanty. This, however, does not proceed ſo much from the unfruitfulneſs of the place, as from the vaſt herds of cattle which rove the whole year long from place to place; by which means all the graſs in ſpring, ſummer, or autumn, no ſooner appears through the long drought which ſucceeds the rainy ſeaſon, but it is immediately devoured or trodden down. The univerſal prevalence of this cuſtom of keeping cattle to wander up and down, joined to the ſlothfulneſs of the Tartars, with their inaptitude and averſion to agriculture, is the reaſon of the total neglect of that ſcience here. Otherwiſe, were the land divided into portions and properly managed, there would be a ſufficiency for the cattle, and the reſt would be fruitful in corn and grain. By this means alone the Crim would become a fertile country, and no natural defect would be found in oppoſition to the welfare of its inhabitants. The truth of this is well known by their neighbours; where, of a hundred Tartars, one perhaps follows huſbandry, who finds it to anſwer to ſo much profit, that he has not only enough for his own uſe, but wherewith to ſell to the ninety-nine.

This peninſula, which is indeed but a little diſtrict, yet, from the many advantages conferred upon it by nature, may be eſteemed peculiarly rich, is divided into the hilly country and the flat. The latter, which extends from Perekop to Koſlof and the river Bulganap, to Karaſubaſar, Keffa, and Yenicali, is ſtrewn there and there with little Tartar villages, maintained by cattle and the produce of the ſalt lakes. The highlands, or hilly country, form the ſouthern part of the Crim, along the ſtraight coaſt of the Black ſea, and ſtretching weſtward in a right line from Keffa to the vicinity of Belbek. Theſe hills are compoſed of layers of chalk; which, in the headlands and promontories, is ſoft, but more inland quite hard. The ſtrata of the high hills are like thoſe of the promontories, and take a direction from north to ſouth. Theſe qualities of the ſtrata prevail not throughout the whole hills, but only in the large and lofty ones; ſuch as the two that riſe near Karaſubaſar, and one very high by Achmetſched, which bears the name of Aktau. The other ſmaller hills lie ſcattered and diſperſed, but take the names of the greater ones, to which they ſeem to belong; as the great ridge of Caucaſus does, which extends beyond the Donau, through Bulgaria, and are named *Palkans*.

All accounts agree in this, that nature has favoured thoſe highland countries with great advantages, and bleſſed them with abundance of all things. A number of ſprings that flow from the mountains form the two conſiderable rivers Salgir and Karaſu, which run into the Rotten ſea. The former, which takes its riſe from a cavern in a high hill near Achmetſched, falls ſtraight into the plain below, and waters a great part of the Crim; the other commencing behind Karaſubaſar, falls likewiſe into the plain, and mingles with the Salgir. There are many other little rivers and ſtreams, which run eaſtward, and either join the two fore-mentioned or fall immediately into the Rotten ſea. All the ſtreams, for the whole length of the hills, which begin at Keffa, and proceed in a chain of the ſame height, flow to the north or the north-eaſt, excepting the one behind Achmetſched, where the great mountain Aktau is, which falls on the other ſide; this river, riſing on the northern ſide of this mountain, flows, as was before obſerved, towards the north-eaſt, to the Salgir and the Rotten ſea; as likewiſe thoſe which ſpring on the weſtern ſide take their courſe weſtward to the Bulganak, and thence ſtraight to the Black ſea; which alſo receives all the other little rivers that ariſe from theſe hills, as the Amma, the Katſcha, the Belbek, the Kaſulkioi, &c.

The mountains are well covered with wood fit for the purpoſe of ſhip-building, and contain plenty of wild beaſts. The valleys conſiſt of fine arable land; on the ſides of the hills grow corn and vines in great abundance, and the earth is rich in mines. But theſe mountaineers are as careleſs and negligent as the inhabitants of the deſerts; ſlighting all theſe advantages; and, like their brethren of the lowlands, are ſufficiently happy if they are in poſſeſſion of a fat ſheep and as much bread as ſerves them to eat.

About 20 years ago this peninſula was uncommonly full of inhabitants and wealth. They reckoned at that time at leaſt 1200 villages; but, from the late troubles in the Crim, it has loſt more than a third part of its inhabitants, and now, wherever we turn, we meet with the ruins of large villages and dwellings. The people were compoſed of various nations, who lived together under the Tartars in the moſt unbounded freedom; but in the late Turkiſh war they either put themſelves under the Ruſſian government, and were transferred to that empire, or fled to Abcaſia and the Tſchirkaſſian hills.

The houſes in the towns, as well as the villages, are for the moſt part of ſquare timbers, having the interſtices filled with brick work, if the poſſeſſor can afford it, and thoſe of the poorer ſort with turf. The chinks and crannies are made tight with clay, and then plaiſtered within and without. The covering is commonly either of bricks or of turfs. Only the medſcheds, minarets, and baths, are of ſtone, and a few extremely handſome of marble. They have chimneys in the chambers, at which they likewiſe dreſs their victuals; but ſtoves in the Ruſſia manner none. In extreme froſts a great iron pan of charcoal is brought into the room, for making it comfortable. Their cuſtom is, to ſit upon low ſofas, with Turkiſh coverings and cuſhions, or upon a clay ſeat, ſomewhat raiſed above the earth, and ſpread with a carpet. In theſe rooms are cupboards and cheſts, often covered with cuſhions, to ſerve as ſeats; in which they keep their gold, ſilver, and valuables. Such are the inner apartments or harams, in which the women generally live; the others are not ſo fine. Theſe contain only a ſofa, or a bank of clay covered with a carpet, as in the chimney rooms.

The rich Tartars, and their nobility or murzas (excepting only ſuch as are about the perſon of the khan), commonly dwell all the year round in the country, coming only to town when they have buſineſs there. There are but few towns in the Crim, at leaſt in compariſon of its former population. The Krimſkoi Tartars have no tribunal of juſtice, controverſies and quarrels being ſeldom heard of among them; and if a diſpute ſhould ariſe, it is immediately ſettled by an appeal to the Koran. Little differences in the villages inevitably happening about property, or other matters not taken notice of in that code, are amicably adjuſted by the elderman or abeſes; but in the towns all weighty concerns, excepting the ſingle caſe of murder or homicide, are brought before the kaimakan, or commandant, who ſettles them abſolutely without appeal.

The reſidence of the khans of the Crimea was formerly Bachtſchiſarai, in which city they held their ſeat for upwards of 200 years. They went thither from Eſki-Crim, or Old Crim, the capital city of the Genoeſe, upon Bengli Ghirei Khan's plundering the ſeaports, and driving all the Genoeſe from their ſtations. Before Eſki-Crim, and indeed upon the firſt coming of the Tartars into this peninſula, the ſovereign reſidence was at Koſlof; but here they remained not long. Under the late Khan Shagin Ghirei it was held at Keffa, the ancient Theodoſia; which is ten miles diſtant from Eſki-Crim, ſaid to be the Cimmerium of the ancients.

The principal cities or towns of the Crimea are: 1. *Bachtſchiſarai*, an extenſive and wealthy city, lying in a vale between two high mountains, and ſurrounded by a number of gardens. From this circumſtance it has its name; *bachtſchi*, ſignifying in the Tartarian language "a garden," and *ſarai*, "a palace." It formerly contained 3000 houſes, and many ſumptuous medſcheds. The palace of the khans, with its gardens and ponds, was much improved under the government of Khan Kerim Ghirei, under whoſe government the laſt Turkiſh war took its riſe. In this palace is the burial-place of all the khans of Crimea, wherein all the khans that have reigned here lie interred. The fine Krimſkoi vines, with their large cluſters of grapes, grow in great plenty all about this town, and a profuſion of other delicious fruits, from whence the neighbouring parts of Ruſſia are ſupplied. 2. *Keffa*, the preſent reſidence of the khans, ſtands on the ſhore of a large harbour in the Black ſea. Its ſite is on the declivity of a long ridge of mountains; and is mantled by a ſtone wall, fortified by ſeveral towers, and encompaſſed by a deep ditch. On both ſides of the city formerly ſtood caſtles, and in the middle of them a lofty turret for the purpoſe of giving ſignals by fire. Before the wall were wide extended ſuburbs; containing among other conſiderable buildings, medſcheds, churches for the Greek and Armenian worſhip; of all which now only the veſtiges remain. The caſtles and towers lie alſo in ruins; and not one-third part of the houſes of the city itſelf are now remaining, and thoſe chiefly built of materials taken from the aforeſaid ruins. They formerly reckoned Keffa to contain 4000 houſes, including the ſuburbs, with a number of medſcheds and Chriſtian churches; but this number has been much diminiſhed by the laſt Turkiſh war. The preſent inhabitants conſiſt moſtly of Tartars; who carry on a trade by no means inconſiderable, in commodities brought from Turkey. The late khan, an intelligent and enlightened perſonage, made this city the place of his reſidence, and brought hither the mint from Bachtſchiſarai, built himſelf a palace, and erected a divan, which aſſembled three times a-week, and the fourth time was held in the palace of the khan, in which he always perſonally aſſiſted. Here is alſo a cuſtomhouſe, the management of which is farmed out. 3. *Karaſubaſar*, likewiſe a very rich city in former times, ſtands at the beginning of the mountains, about half-way between Keffa and Bachtſchiſarai. It is a large trading town; contains a conſiderable number of dwelling-houſes and medſcheds, but the greateſt part of them in decay, and many fine gardens. This place is the moſt famous in all the Crim for its trade in horſes, and has a market once a-week for that article of traffic; to which are likewiſe brought great numbers of buffaloes, oxen, cows, camels, and ſheep for ſale. Near this city flows one of the principal rivers of the Crim, called the *Karaſu*, that is, the Black Water. Of this river they have an opinion in Ruſſia, that one part of it flows upwards for ſeveral verſts together. But this is in ſome ſort true, not only of the Karaſu, but of all the rivers of the Crim that have a ſtrong current. The Tartars, who dwell either in the valleys or on the ſides of the mountains (frequently without conſidering whether the place is ſupplied with water or not), dig canals either from the ſource of the next river, or from that part of it which lies neareſt to their particular habitation, about an arſhine in breadth, for their gardens and domeſtic uſe. From theſe they cut ſmaller ones through the villages, to ſupply them with water, and not unfrequently to drive a mill. Theſe canals appear, to the imagination of the common people, to run in a contrary direction to the current of the river; and in fact theſe canals do lie, in many places for a verſt in length, ſome fathoms higher than the level of the ſtream from whence they are ſupplied. 4. *Achmetſted*, a pretty large city not far from Bachtſchiſarai; now made the capital of all the Crimea by the regulations of Prince Potemkin in the ſummer of 1785. 5. *Koſlof*, formerly a very conſiderable trading town, lies on the weſtern ſide of the peninſula, in a bay of the Black ſea; which, as well as the ſound at Keffa, might rather be called a road than a haven. This was the firſt town the Tartars poſſeſſed themſelves of on their firſt entrance into the Crim, and eſtabliſhed a cuſtomhouſe therein, after the example of the Genoeſe, which is now farmed out.

The other remarkable places are, *Sudak*, which is built on the hills upon the ſhore of the Black ſea, at the ſouth ſide of the peninſula, and is famous for its excellent wine, reſembling Champagne both in colour and ſtrength; *Aluſchti*, on the ſame ſide, among the hills on the ſea ſhore; *Balaklava*, where there is a fine harbour, and perhaps the only one on the Black ſea, containing ample room for a very good fleet; *Inkerman* may be noticed for its commodious though not very large haven, called *Achtiar;* and *Mangup*, the old Cherſoneſus: which were all formerly very flouriſhing towns; but are now either in ruins, or dwindled into ſmall villages.

All theſe places, ſo long as the Genoeſe remained maſters of the Crim, were well fortified; but the Tartars, in taking them, demoliſhed all the works. While they were under the Turks, they left the fortreſſes of Keffa, Kertſch, and Koſlof, and built the fort Arabat on the neck of land between the ſea of Azof (or Palus Mæotis) and the Rotten ſea, where Perekop alſo is.

In *Arabat* are but few houſes; but here the warlike ſtores of the khans were kept.—*Perekop*, called by the Turks *Or-kapi*, is a fortreſs of moderate ſtrength; ſtanding about the middle of the neck of land that joins the peninſula with the continent. This iſthmus, which is at leaſt ſix miles broad, is cut through with a wide and deep ditch lined with ſtone, and reaches from the Black to the Rotten ſea. This was formerly kept without water, but now is filled from both ſeas. On the Crimean ſide a high wall of earth runs the whole length of it, ſtraight from one ſea to the other. The people paſs over the ditch by means of a drawbridge, and through the wall by a gateway. The walls of the fortreſs are ſome fathoms from the road ſide; of which the ruins are only now diſcernible, namely, large brick houſes, with a number of bomb-ſhells and cannon-balls about them, which were formerly kept in the fortreſs. At leaſt two miles from this is a pretty populous but miſerable place, which was probably the town to which this fort belonged. Near the gate is a cuſtomhouſe, where all imports and exports pay duty.

This peninſula was formerly extremely populous; the number of its inhabitants, in Tartars, Turks, Greeks, Armenians, Jews, and others, amounted to above 200,000 men. Since that, however, the greateſt part of the Chriſtians have betaken themſelves to the other parts of the Ruſſian empire, particularly the government of Azof; and many other inhabitants, particularly Tartars, have gone to Taman and Abchaſia; ſo that the preſent population of the Crim cannot now be reckoned at more than 70,000 men at moſt.

The Crim was heretofore divided into 24 kaduliks or diſtricts; namely, Yenikali, Kertſch, Arabat, Eſki-krim, Keffa, Karaſubaſar, Sudak, Achmetſched, Yalof, Bachtſchiſarai, Balaklava, Mangup, Inkerman, Koſlof, Or, Manſur, Tarkan, Sivaſch, Tiſchongar, Sarubulat, Barun, Argun, Sidſchugut, and Schirin. Several of theſe diſtricts are named after the town or village wherein the murza, their governor, dwells; and many of them are at preſent in a ſtate of total decay.

CRIMEN FALSI. See *FALSI Crimen*.

CRIMSON, one of the ſeven red colours of the dyers. See DYEING.

CRINGLE, a ſmall hole made in the bolt-rope of ſail, by intertwiſting one of the diviſions of a rope, called a *ſtrand*, alternately round itſelf and through the *ſtrands* of the bolt-rope, till it becomes threefold, and aſſumes the ſhape of a wreath or ring. The uſe of the cringle is generally to contain the end of ſome rope, which is faſtened thereto for the purpoſe of drawing up the ſail to its yard, or of extending the ſkirts by the means of *bridles*, to ſtand upon a ſide wind. The word ſeems to be derived from *krinckelen* (Belg.) "to run into twiſts."

CRINUM, ASPHODEL-LILY; a genus of plants belonging to the hexandria claſs; and in the natural method ranking under the 9th order, *Spathaceæ*. See BOTANY *Index*.

CRISIS, in *Medicine*, is uſed in different ſenſes, both by the ancient and modern phyſicians. With ſome it means frequently no more than the excretion of any noxious ſubſtance from the body. Others take the word for a ſecretion of the noxious humours made in a fever. Others uſe it for the critical motion itſelf; and Galen defines a criſis in fevers, a ſudden and inſtantaneous change, either for the better or the worſe, productive of recovery or death.

CRISPIN *and* CRISPIANUS, two legendary ſaints, whoſe feſtival, as marked in the kalendar, is on the 25th of October. According to the legend, they were brethren, born at Rome; from whence they travelled to Soiſſons in France, about the year 303, to propagate the Chriſtian religion; and becauſe they would not be chargeable to others for their maintenance, they exerciſed the trade of ſhoemakers: but the governor of the town diſcovering them to be Chriſtians, ordered them to be beheaded. From which time the ſhoemakers made choice of them for their tutelar ſaints.

CRISTÆ, in *Surgery*, a term for certain excreſcences about the anus and pudenda. See MEDICINE *Index*.

CRISTA GALLI, in *Anatomy*, an eminence in the middle of the *os ethmoides*, advancing within the cavity of the cranium; and to which is faſtened that part of the dura mater which divides the brain, called *falx*. It has its name from its figure, which reſembles that of a cock's comb. In adults, this proceſs appears of a piece with the *ſeptum narium*. See ANATOMY *Index*.

CRITERION, or CRITERIUM, a ſtandard by which propoſitions and opinions are compared, in order to diſcover their truth or falſehood.

CRITHE, in *Surgery*, commonly called the *ſtye*, is a ſort of tubercle that grows on the eyelids. When ſmall, it is ſeated on the edge of the eyelid; but when large, it ſpreads further. When they do not ſuppurate they become wens. They are apt to diſappear and return. If there is inflammation, endeavour to ſuppurate it with the white bread poultice: if it is hard, deſtroy it with a mixture of equal parts of hog's lard and quickſilver. If the lower eyelid is affected, the tumor is more frequently on its inſide; and then it is beſt to diſſect it, or to make way for it outwardly by applying a cauſtic on the ſkin juſt upon it.

CRITHUM, SAMPHIRE; a genus of plants belonging to the pentandria claſs; and in the natural method ranking under the 45th order, *Umbellatæ*. See BOTANY *Index*.—Its leaves are an excellent pickle uſed for ſauces, and are by many eaten raw in ſalads. It is of a ſaltiſh reliſh, palatable, and comfortable to the ſtomach. It is not very eaſily preſerved in gardens. It muſt be ſown on gravelly or rocky ground, half an inch deep; in which ſituation the plants will come up, and laſt ſome years.

CRITHOMANCY, a kind of divination, performed by conſidering the dough or matter of the cakes offered in ſacrifice, and the meal ſtrewed over the victims to be killed. Hence, in regard they ordinarily uſed barley-meal in theſe ceremonies, this kind of divination was called *crithomancy*, from κριθη, *barley*, and μαντεια *divination*.

CRITIAS, one of the 30 tyrants ſet over Athens by the Spartans. He was eloquent and well bred, but of dangerous principles. He cruelly perſecuted his enemies, and put them to death. He was killed about 400 years before the Auguſtan age, in a battle againſt thoſe citizens whom his oppreſſion had baniſhed. He had been among the diſciples of Socrates, and had written elegies and other compoſitions, of which ſome fragments remain.

CRITICAL DAYS and SYMPTOMS, among phyſicians, are certain days and ſymptoms in the courſe of acute diſeaſes, which indicate the patient's ſtate, and determine him either to recover or grow worſe. See MEDICINE *Index*.

CRITICISM, the art of judging with propriety concerning any object or combination of objects. But, in a more limited ſenſe, the ſcience of criticiſm is confined to the fine arts. The principles of the fine arts are beſt unfolded by ſtudying the ſenſitive part of our nature, and by learning what objects are naturally agreeable and what are naturally diſagreeable. The man who aſpires to be a critic in theſe arts, muſt pierce ſtill deeper: he muſt clearly perceive what objects are lofty, what low, what are proper or improper, what are manly, and what are mean or trivial. Hence a foundation for judging of taſte, and for reaſoning upon it: where it is conformable to principles, we can pronounce with certainty that it is correct; otherwiſe, that it is incorrect, and perhaps whimſical. Thus the fine arts, like morals, become a rational ſcience; and, like morals, may be cultivated to a high degree of refinement.

Manifold are the advantages of criticiſm, when thus ſtudied as a rational ſcience. In the firſt place, a thorough acquaintance with the principles of the fine arts redoubles the entertainments thoſe arts afford. To the man who reſigns himſelf entirely to ſentiment or feeling, without interpoſing any ſort of judgment, poetry, muſic, painting, are mere paſtime; in the prime of life, indeed, they are delightful, being ſupported by the force of novelty and the heat of imagination: but they loſe their reliſh gradually with their novelty; and are generally neglected in the maturity of life, which diſpoſes to more ſerious and more important occupations. To thoſe who deal in criticiſm as a regular ſcience, governed by juſt principles, and giving ſcope to judgment as well as to fancy, the fine arts are a favourite entertainment; and in old age maintain that reliſh which they produce in the morning of life.

In the next place, a philoſophical inquiry into the principles of the fine arts, inures the reflecting mind to the moſt enticing ſort of logic: the practice of reaſoning upon ſubjects ſo agreeable tends to a habit; and a habit ſtrengthening the reaſoning faculties, prepares the mind for entering into ſubjects more difficult and abſtract. To have, in this reſpect, a juſt conception of the importance of criticiſm, we need but reflect upon the common method of education; which, after ſome years ſpent in acquiring languages, hurries us, without the leaſt preparatory diſcipline, into the moſt profound philoſophy: a more effectual method to alienate the tender mind from abſtract ſcience, is beyond the reach of invention: and accordingly, with reſpect to ſuch ſpeculations, the bulk of our youth contract a ſort of hobgoblin terror, which is ſeldom, if ever, ſubdued. Thoſe who apply to the arts are trained in a very different manner: they are led, ſtep by ſtep, from the eaſier parts of the operation to what are more difficult; and are not permitted to make a new motion till they be perfected in thoſe which regularly precede it. The ſcience of criticiſm appears then to be a middle link, connecting the different parts of education into a regular chain. This ſcience furniſheth an inviting opportunity to exerciſe the judgment: we delight to reaſon upon ſubjects that are equally pleaſant and familiar; we proceed gradually from the ſimpler to the more involved caſes: and in a due courſe of diſcipline, cuſtom, which improves all our faculties, beſtows acuteneſs upon thoſe of reaſon, ſufficient to unravel all the intricacies of philoſophy.

Nor ought it to be overlooked, that the reaſonings employed upon the fine arts are of the ſame kind with thoſe which regulate our conduct. Mathematical and metaphyſical reaſons have no tendency to improve ſocial intercourſe; nor are they applicable to the common affairs of life: but a juſt taſte in the fine arts, derived from rational principles, furniſhes elegant ſubjects for converſation, and prepares us finely for acting in the ſocial ſtate with dignity and propriety.

The ſcience of rational criticiſm tends to improve the heart not leſs than the underſtanding. It tends, in the firſt place, to moderate the ſelfiſh affections: by ſweetening and harmonizing the temper, it is a ſtrong antidote to the turbulence of paſſion and violence of purſuit; it procures to a man ſo much mental enjoyment, that, in order to be occupied, he is not tempted in youth to precipitate into hunting, gaming, drinking; nor in middle age, to deliver himſelf over to ambition; nor in old age, to avarice. Pride and envy, two diſguſtful paſſions, find in the conſtitution no enemy more formidable than a delicate and diſcerning taſte: the man upon whom nature and culture have beſtowed this bleſſing, feels great delight in the virtuous diſpoſitions and actions of others; he loves to cheriſh them, and to publiſh them to the world: faults and failings, it is true, are to him not leſs obvious; but theſe he avoids, or removes out of ſight, becauſe they give him pain. On the other hand, a man void of taſte, upon whom the moſt ſtriking beauties make but a faint impreſſion, has no joy but in gratifying his pride or envy by the diſcovery of errors and blemiſhes. In a word, there may be other paſſions, which, for a ſeaſon, diſturb the peace of ſociety more than thoſe mentioned: but no other paſſion is ſo unwearied an antagoniſt to the ſweets of ſocial intercourſe: theſe paſſions, tending aſſiduouſly to their gratification, put a man perpetually in oppoſition to others; and diſpoſe him more to reliſh bad than good qualities, even in a companion. How different that diſpoſition of mind, where every virtue in a companion or neighbour, is, by refinement of taſte, ſet in its ſtrongeſt light; and defects or blemiſhes, natural to all, are ſuppreſſed, or kept out of view!

In the next place, delicacy of taſte tends not leſs to invigorate the ſocial affections than to moderate thoſe that are ſelfiſh. To be convinced of this tendency, we need only reflect, that delicacy of taſte neceſſarily heightens our ſenſibility of pain and pleaſure, and of courſe our ſympathy, which is the capital branch of every ſocial paſſion. Sympathy, in particular, invites a communication of joys and ſorrows, hopes and fears: ſuch exerciſe, ſoothing and ſatisfactory in itſelf, is neceſſarily productive of mutual good-will and affection.

One other advantage of rational criticiſm is reſerved to the laſt place, being of all the moſt important; which is, that it is a great ſupport to morality. No occupation attaches a man more to his duty than that of cultivating a taſte in the fine arts: a juſt reliſh of what is beautiful, proper, elegant, and ornamental, in writing or painting, in architecture or gardening, is a fine preparation for the ſame juſt reliſh of theſe qualities in character and behaviour. To the man who has acquired a taſte ſo acute and accompliſhed, every action wrong or improper muſt be highly diſguſtful: if, in any inſtance, the overbearing power of paſſion ſway him from his duty, he returns to it upon the firſt reflection with redoubled reſolution never to be ſwayed a ſecond time: he has now an additional motive to virtue, a conviction derived from experience, that happineſs depends on regularity and order, and that a diſregard to juſtice or propriety never fails to be puniſhed with ſhame and remorſe.

For the rules of criticiſm applicable to the fine arts, and derived from human nature, ſee ARCHITECTURE, BEAUTY, CONGRUITY, COMPARISON, GRANDEUR, &c.

CRITO, an Athenian philoſopher, flouriſhed 400 years before Chriſt. He was one of the moſt zealous diſciples of Socrates, and ſupplied him with whatever he wanted. He had ſeveral ſcholars who proved great men, and he compoſed ſome dialogues which are loſt.

CRITOLAUS, a citizen of Tegea in Arcadia. He with two brothers fought againſt the three ſons of Demonſtratus of Pheneus, to put an end to a long war between their reſpective nations. The brothers of Critolaus were both killed, and he alone remained to withſtand his three bold antagoniſts. He conquered them; and when at his return his ſiſter deplored the death of one of his antagoniſts, to whom ſhe was betrothed, he killed her in a fit of reſentment. The offence deſerved capital puniſhment; but he was pardoned on account of the ſervices he had rendered his country. He was afterwards general of the Achæans; and it is ſaid that he poiſoned himſelf becauſe he had been conquered at Thermopylæ by the Romans, about 146 years before the Auguſtan age.

CRIZZELLING, in the glaſs trade, a kind of roughneſs ariſing on the ſurface of ſome kinds of glaſs. This was the fault of a peculiar ſort of glaſs made in Oxfordſhire and ſome other places, of black flints, a cryſtallized ſand, and a large quantity of nitre, tartar, and borax. The glaſs thus made is very beautiful, but, from the too great quantities of the ſalts in the mixture, is ſubject to crizzel; that is, the ſalts in the mixture, from their too great proportion, are ſubject, either from the adventitious nitre of the air from without, or from warm liquors put in them, to be either increaſed in quantity or diſſolved, and thereby induce a ſcabrities or roughneſs irrecoverably clouding the tranſparence of the glaſs. This is what was called *crizzelling*; but by uſing an Italian white pebble, and abating the proportions of the ſalts, the manufacture is now carried on with advantage, and the glaſs made with theſe ſalts is whiter than the fineſt Venetian, and is ſubject to no faults.

CROATIA, a part of the ancient Illyricum, is bounded on the eaſt by Sclavonia and Boſnia, on the ſouth and ſouth-weſt by Morlachia, and on the north by the Drave, which ſeparates it from a part of Sclavonia. It is about 80 miles in length and 70 in breadth, and was once divided between the Hungarians and Turks; but now the greateſt part of it is ſubject to the houſe of Auſtria. The Croats derive their origin from the Sclavi; and their language is a dialect of the Sclavonian, approaching very near to that of the Poles. The country is divided into two parts, viz. that under, and that beyond, the Save. In the late wars between the empreſs queen and the king of Pruſſia, no leſs than 50,000 men were raiſed out of this ſmall territory. Both horſe and foot are good ſoldiers, eſpecially the former. The ſoil, where cultivated, is fruitful in wine and oil, &c. but being a frontier country, and much expoſed to inroads, it is not ſo well cultivated as it otherwiſe might be.

CROCODILE. See LACERTA, ERPETOLOGY *Index*.

Foſſil CROCODILE, one of the greateſt curioſities in the foſſil world which the late ages have produced. It is the ſkeleton of a large crocodile, almoſt entire, found at a great depth under ground, bedded in ſtone. This was in the poſſeſſion of Linkius, who wrote many pieces of natural hiſtory, and particularly an accurate deſcription of this curious foſſil. It was found in the ſide of a large mountain in the midland part of Germany, and in a ſtratum of black foſſil ſtone, ſomewhat like our common ſlate, but of a coarſer texture, the ſame with that in which the foſſil fiſhes in many parts of the world are found. This ſkeleton had the back and ribs very plain, and was of a much deeper black than the reſt of the ſtone; as is alſo the caſe in the foſſil fiſhes which are preſerved in this manner. The part of the ſtone where the head lay was not found; this being broken off juſt at the ſhoulders, but that irregularly; ſo that in one place, a part of the back of the head was viſible in its natural form. The two ſhoulder-bones were very fair, and three of the feet were well preſerved: the legs were of their natural ſhape and ſize, and the feet preſerved even to the extremities of the five toes of each.

CROCODILE (*crocodilus*), in *Rhetoric*, a captious and ſophiſtical kind of argumentation, contrived to ſeduce the unwary, and draw them ſpeciouſly into a ſnare. It has its name crocodile from the following occaſion, invented by the poets. A poor woman, begging a crocodile that had caught her ſon walking by the riverſide to ſpare and reſtore him, was anſwered, that he would reſtore him, provided ſhe ſhould give a true anſwer to a queſtion he ſhould propoſe: the queſtion was, Will I reſtore thy ſon, or not? To this the poor woman, ſuſpecting a deceit, ſorrowfully anſwered, Thou wilt not : and demanded to have him reſtored, becauſe ſhe had anſwered truly. Thou lieſt, ſays the crocodile ; for if I reſtore him thou haſt not anſwered truly : I cannot therefore reſtore him without making thy anſwer falſe. Under this head may be reduced the propoſitions called *mentientes* or *inſolubiles ;* which deſtroy themſelves. Such is that of the Cretan poet : *Omnes ad unum Cretenſes ſemper mentiuntur :* " all the Cretans, to a man, always lie." Either, then the poet lies when he aſſerts that the Cretans all lie, or the Cretans do not all lie.

CROCUS, SAFFRON ; a genus of plants belonging to the triandria claſs ; and in the natural method ranking under the 6th order *Enſatæ*. See BOTANY *Index*.

CROCUS, in *Chemiſtry*, denotes any metal calcined to a red or deep yellow colour.

CROCUS Metallorum, an emetic preparation of antimony and nitre. See CHEMISTRY *Index*.

CRŒSUS, the laſt king of Lydia, remarkable for his riches, his conqueſts, his temporary proſperity, and the ſad reverſe of his fortune. He ſubdued the Phrygians, Myſians, Paphlagonians, Thracians, and Carians ; amaſſed together immenſe riches ; and became one of the moſt powerful and magnificent princes in the world. He drew the learned to his court, and took a pleaſure in converſing with them. Thales of Miletus, Pittacus of Mitylene, Bias of Priené, Cleobulus of Lindus, and moſt of the other " wiſe men," as they are emphatically ſtyled, who lived in that age, as well as Æſop the fabuliſt, and the elegant Greek poets of the times, were bountifully received at the court of Crœſus. There is ſtill on record a memorable converſation between that prince and Solon, which ſeemed to predict the ſubſequent events of his reign, and which had a late but important influence on the character and fortune of the Lydian king. Crœſus having entertained his Athenian gueſt, according to the ancient faſhion, for ſeveral days, before he aſked him any queſtions, oſtentatiouſly ſhowed him the magnificence of his palace, and particularly the riches of his treaſury. After all had been diſplayed to the beſt advantage, the king complimented Solon upon his curioſity and love of knowledge ; and aſked him, as a man who had ſeen many countries, and reflected with much judgment upon what he had ſeen, Whom of all men he eſteemed moſt happy ? By the particular occaſion, as well as the triumphant air with which the queſtion was propoſed, the king made it evident that he expected flattery rather than information. But Solon's character had not been enervated by the debilitating air of a court ; and he replied with a manly freedom, " Tellus, the Athenian." Crœſus, who had ſcarcely learned to diſtinguiſh, even in imagination, between wealth and happineſs, inquired with a tone of ſurpriſe, why this preference to Tellus ? " Tellus," rejoined Solon, " was not conſpicuous for his riches or his grandeur, being only a ſimple citizen of Athens ; but he was deſcended from parents who deſerved the firſt honours of the republic. He was equally fortunate in his children, who obtained univerſal eſteem by their probity, patriotiſm, and every uſeful quality of the mind or body : and as to himſelf, he died fighting gallantly in the ſervice of his country, which his valour rendered victorious in a doubtful combat ; on which account the Athenians buried him on the ſpot where he fell, and diſtinguiſhed him by every honour which public gratitude can confer on illuſtrious merit."

Crœſus had little encouragement, after this anſwer, to aſk Solon, in the ſecond place, Whom, next to Tellus, he deemed moſt happy ? Such, however, is the illuſion of vanity, that he ſtill ventured to make this demand ; and ſtill, as we are informed by the moſt circumſtantial of hiſtorians, entertained hopes of being favourably anſwered. But Solon replied with the ſame freedom as before, " The brothers Cleobis and Biton, two youths of Argos, whoſe ſtrength and addreſs were crowned with repeated victory at the Olympic games ; who deſerved the affection of their parents, the gratitude of their country, the admiration of Greece ; and who, having ended their lives with peculiar felicity, were commemorated by the moſt ſignal monuments of immortal fame." " And is the happineſs of a king, then," ſaid Crœſus, " ſo little regarded, O Grecian ſtranger, that you prefer to it the mean condition of an Athenian or Argive citizen ?" The reply of Solon ſufficiently juſtified his reputation for wiſdom. " The life of man," ſaid he, conſiſts of 70 years, which make 25,550 days ; an immenſe number : yet in the longeſt life, the events of any one day will not be found exactly alike to thoſe of another. The affairs of men are liable to perpetual viciſſitudes : the Divinity who preſides over our fate is envious of too much proſperity ; and all human life, if not condemned to calamity, is at leaſt liable to accident. Whoever has uninterruptedly enjoyed a proſperous tide of ſucceſs may juſtly be called *fortunate :* but he cannot before his death be entitled to the epithet of *happy*."

The events which ſoon followed this converſation, prove how little ſatisfaction is derived from the poſſeſſion of a throne. Victorious in war, unrivalled in wealth, ſupreme in power, Crœſus felt and acknowledged his unhappineſs. The warmeſt affections of his ſoul centered in his ſon Atys, a youth of the moſt promiſing hopes, who had often fought and conquered by his ſide. The ſtrength of his attachment was accompanied with an exceſs of paternal care, and the anxiety of his waking hours diſturbed the tranquillity of his reſt. He dreamed that his beloved ſon was ſlain by a dart ; and the ſolicitude with which he watched his ſafety, preventing the youth from his uſual occupations and amuſements, and thereby rendering him too eager to enjoy them, moſt probably expoſed him to the much-dreaded misfortune. Reluctantly permitted to engage in a party of hunting, the juvenile ardour of Atys, increaſed by the impatience of long reſtraint, made him neglect the precautions neceſſary in that manly amuſement. He was ſlain by a dart aimed at a wild boar of monſtrous ſize, which had long ſpread terror over the country of the Myſians. The weapon came from the hand of Adraſtus, a Phrygian prince and fugitive, whom Crœſus had purified from the involuntary guilt of a brother's blood, and long diſtinguiſhed by peculiar remarks of bounty. To the grateful protection of the Phrygian, Crœſus recommended, at parting, the ſafety of his beloved ſon. A mournful proceſſion of Lydians brought to Sardis the dead body of Atys. The ill-fated murderer followed behind. When they approached the royal preſence, Adraſtus ſtepped forward and entreated Crœſus to put him to death; thinking life no longer to be endured after killing, firſt his own brother, and then the ſon of his benefactor. But the Lydian king, notwithſtanding the exceſs of his affliction, acknowledged the innocence of Adraſtus, and the power of fate. "Stranger, your action is blameleſs, being committed without deſign. I know that my ſon was deſtined to a premature death." Adraſtus, though pardoned by Crœſus, could not pardon himſelf. When the mourners were removed, he privately returned, and periſhed by his own hand on the tomb of Atys.

Two years Crœſus remained diſconſolate for the loſs of his ſon: and might have continued to indulge his unavailing affliction during the remainder of life, had not the growing greatneſs of Perſia, which threatened the ſafety of his dominions, rouſed him from his dream of miſery. (See Lydia).—He marched againſt Cyrus with a great army, but was defeated; and retreating to his capital Sardis, was there beſieged. The city was taken by aſſault; and as a Perſian ſoldier was going to kill Crœſus, that prince's only ſurviving ſon, who had hitherto been dumb, terrified at his danger, cried, *Stop ſoldier, and touch not Crœſus.* But though delivered by this extraordinary accident from the blind rage of the ſoldier, he ſeemed to be reſerved for a harder fate. Dragged into the preſence of his conqueror, he was loaded with irons; and the ſtern, unrelenting Cyrus, of whoſe humane temper of mind we have ſo beautiful, but ſo flattering, a picture in the philoſophical romance of Xenophon, ordered him, with the melancholy train of his Lydian attendants, to be committed to the flames. An immenſe pile of wood and other combuſtibles was erected in the moſt ſpacious part of the city. The miſerable victims, bound hand and foot, were placed on the top of the pyre. Cyrus, ſurrounded hving generals, witneſſed the dreadful ſpectacle, either from an abominable principle of ſuperſtition he had bound himſelf by a vow to ſacrifice Crœſus as the firſt fruits of his Lydian victory, or from a motive of curioſity, equally cruel and impious, to try whether Crœſus, who had ſo magnificently adorned the temples and enriched the miniſters of the gods, would be helped in time of need by the miraculous interpoſition of his much honoured protectors. Meanwhile the unfortunate Lydian, oppreſſed and confounded by the intolerable weight of his preſent calamity compared with the ſecurity and ſplendor of his former ſtate, recollected his memorable converſation with the Athenian ſage, and uttered with a deep groan the name of *Solon*. Cyrus aſked by an interpreter, "Whoſe name he invoked?" "*His*," replied Crœſus, emboldened by the proſpect of certain death, "whoſe words ought ever to ſpeak to the heart of kings." This reply not being ſatiſfactory, he was commanded to explain at full length the ſubject of his thoughts. Accordingly he related the important diſcourſe which had paſſed between himſelf and the Athenian, of which it was the great moral, That no man could be called happy till his death.

The words of a dying man are fitted to make a ſtrong impreſſion on the heart. Thoſe of Crœſus deeply affected the mind of Cyrus. The Perſian conſidered the ſpeech of Solon as addreſſed to himſelf. He repented of his intended cruelty towards the unfortunate prince, who had formerly enjoyed all the pomp of proſperity: and dreading the concealed vengeance that might lurk in the boſom of fate, gave orders that the pyre ſhould be extinguiſhed. But the workmen who had been employed to prepare it, had performed their taſk with ſo much care, that the order could not ſpeedily be obeyed. At that moment, Crœſus calling on Apollo, whoſe favourite ſhrine of Delphi had experienced his generous munificence, and whoſe perfidious oracle had made him ſo ungrateful a return; the god, it is ſaid, ſent a plentiful ſhower to extinguiſh the pyre. This event, which ſaved the life, and which ſufficiently atteſted the piety, of Crœſus, ſtrongly recommended him to the credulity of his conqueror. It ſeemed impoſſible to pay too much reſpect to a man who was evidently the favourite of heaven. Cyrus gave orders that he ſhould be ſeated by his ſide, and thenceforth treated as a king; a revolution of fortune equally ſudden and unexpected. But the mind of Crœſus had undergone a ſtill more important revolution: for, tutored in the uſeful ſchool of adverſity, he learned to think with patience and to act with prudence, to govern his own paſſions by the dictates of reaſon, and to repay by wholeſome advice the generous behaviour of his Perſian maſter.

The firſt advantage which he derived from the change in Cyrus's diſpoſition towards him, was the permiſſion of ſending his fetters to the temple of the Delphian Apollo, whoſe flattering oracles had encouraged him to wage war with the Perſians. "Behold," were his meſſengers inſtructed to ſay, "the trophies of our promiſed ſucceſs! behold the monuments of the unerring veracity of the god!" The Pythia heard their reproach with a ſmile of contemptuous indignation, and anſwered it with that ſolemn gravity which ſhe was ſo carefully taught to aſſume: "The gods themſelves cannot avoid their own deſtiny, much leſs avert, however they may retard, the determined fates of men. Crœſus has ſuffered, and juſtly ſuffered, for the crime of his anceſtor Gyges; who, entruſted as chief of the guards, with the perſon of Candaules, the laſt king of the race of Hercules, was ſeduced by an impious woman to murder his maſter, defile his bed, and to uſurp his royal dignity. For this complicated guilt of Gyges the misfortunes of Crœſus have atoned; but know, that through the favour of Apollo, theſe misfortunes have happened three years later than the fates ordained." The Pythia then proceeded to explain her anſwers concerning the event of the war againſt Cyrus, and proved, to the conviction of the Lydians, that her words, if properly underſtood, portended the deſtruction, not of the Perſian, but of the Lydian empire. Crœſus heard with reſignation the report of his meſſengers, and acknowledged the juſtice of the Delphian oracle, which maintained and increaſed the luſtre of its ancient fame. This fallen monarch ſurvived Cyrus. The manner of his death is not known.

CROFT, a little cloſe adjoining to a dwelling-houſe, and incloſed for paſture or arable land, or any other purpoſe.—In ſome ancient deeds, *cruſta* occurs as the Latin word for a "croft;" but *cum toftis et croftis* is more frequent. Croft is tranſlated in Abbo Floriacenſis by *prædium*, a "farm."

CROISADE, or CRUSADE, a name given to the expeditions of the Chriſtians againſt the infidels for the conqueſt of Paleſtine.

Theſe expeditions commenced in the year 1096. The foundation of them was a ſuperſtitious veneration for thoſe places where our Saviour performed his miracles, and accompliſhed the work of man's redemption. Jeruſalem had been taken, and Paleſtine conquered, by Omar the ſucceſſor of Abu Becr *, who ſucceeded Mahomet himſelf. This proved a conſiderable interruption to the pilgrims, who flocked from all quarters to perform their devotions at the holy ſepulchre. They had, however, ſtill been allowed this liberty, on paying a ſmall tribute to the Saracen caliphs, who were not much inclined to moleſt them. But, in 1065, this city changed its maſters. The Turks took it from the Saracens; and being much more fierce and barbarous than the former, the pilgrims now found they could no longer perform their devotions with the ſame ſafety they did before. An opinion was about this time alſo prevalent in Europe, which made theſe pilgrimages much more frequent than formerly. It was ſomehow or other imagined, that the thouſand years mentioned in the 20th chapter of the Revelations, were fulfilled; that Chriſt was ſoon to make his appearance in Paleſtine, to judge the world; and conſequently that journeys to that country were in the higheſt degree meritorious, and even abſolutely neceſſary. The multitudes of pilgrims which now flocked to Paleſtine meeting with a very rough reception from the Turks, filled all Europe with complaints againſt thoſe infidels, who profaned the holy city by their preſence, and derided the ſacred myſteries of Chriſtianity even in the place where they were fulfilled. Pope Gregory VII. had formed a deſign of uniting all the princes of Chriſtendom againſt the Mahometans; but his exorbitant encroachments upon the civil power of princes had created him ſo many enemies, and rendered his ſchemes ſo ſuſpicious, that he was not able to to make great progreſs in the undertaking. The work was reſerved for a meaner inſtrument.

* See *Arabia*, Nº 76.

Peter, commonly called the *hermit*, a native of Amiens in Picardy, had made the pilgrimage to Jeruſalem; and being deeply affected with the dangers to which that act of piety now expoſed the pilgrims, as well as with the oppreſſion under which the eaſtern Chriſtians now laboured, formed the bold, and, in all appearance, impracticable deſign of leading into Aſia, from the fartheſt extremities of the weſt, armies ſufficient to ſubdue thoſe potent and warlike nations that now held the Holy Land in ſlavery. He propoſed his ſcheme to Martin II. who then filled the papal chair; but he, though ſenſible enough of the advantages which muſt acrue to himſelf from ſuch an undertaking, reſolved not to interpoſe his authority till he ſaw a greater probability of ſucceſs. He ſummoned, at Placentia, a council conſiſting of 4000 eccleſiaſtics and 30,000 ſeculars. As no hall could be found large enough to contain ſuch a multitude, the aſſembly was held in a plain. Here the Pope himſelf, as well as Peter, harangued the people, repreſenting the diſmal ſituation of their brethren in the eaſt, and the indignity offered to the Chriſtian name in allowing the holy city to remain in the hands of the infidels. Theſe ſpeeches were ſo agreeable to thoſe who heard them, that the whole multitude ſuddenly and violently declared for the war, and ſolemnly devoted themſelves to perform this ſervice, which they believed to be ſo meritorious in the ſight of God.

But though Italy ſeemed to have embraced the deſign with ardour, Martin yet thought it neceſſary, in order to inſure perfect ſucceſs, to engage the greater and more warlike nations in the ſame enterpriſe. Having therefore exhorted Peter to viſit the chief cities and ſovereigns of Chriſtendom, he ſummoned another council at Clermont in Auvergne. The fame of this great and pious deſign being now univerſally diffuſed, procured the attendance of the greateſt prelates, nobles, and princes; and when the Pope and the hermit renewed their pathetic exhortations, the whole aſſembly, as if impelled by an immediate inſpiration, exclaimed with one voice, "It is the will of God! it is the will of God!" Theſe words were deemed ſo memorable, and ſo much the effect of a divine impulſe, that they were employed as the ſignal of rendezvous and battle in all future exploits of theſe adventurers. Men of all ranks now flew to arms with the utmoſt ardour, and a croſs was affixed to their right ſhoulder by all who inliſted in this holy enterpriſe.

At this time Europe was ſunk in the moſt profound ignorance and ſuperſtition. The eccleſiaſtics had gained the greateſt aſcendant over the human mind; and the people who committed the moſt horrid crimes and diſorders, knew of no other expiation than the obſervances impoſed on them by their ſpiritual paſtors.

But amidſt the abject ſuperſtition which now prevailed, the military ſpirit had alſo univerſally diffuſed itſelf; and, though not ſupported by art and diſcipline, was become the general paſſion of the nations governed by the feudal law. All the great lords poſſeſſed the right of peace and war. They were engaged in continual hoſtilities with one another: the open country was become a ſcene of outrage and diſorder: the cities, ſtill mean and poor, were neither guarded by walls nor protected by privileges. Every man was obliged to depend for ſafety on his own force, or his private alliances; and valour was the only excellence which was held in eſteem, or gave one man the preeminence above another. When all the particular ſuperſtitions, therefore, were here united in one great object, the ardour for private hoſtilities took the ſame direction; "and all Europe (as the princeſs Anna Comnena expreſſes herſelf), torn from its foundations, ſeemed ready to precipitate itſelf in one united body upon Aſia."

All orders of men, now deeming the croiſades the only road to heaven, were impatient to open the way with their ſwords to the holy city. Nobles, artiſans, peaſants, even prieſts, inrolled their names; and to decline this ſervice was branded with the reproach of impiety or cowardice. The nobles who inliſted themſelves were moved, by the romantic ſpirit of the age, to hope for opulent eſtabliſhments in the eaſt, the chief ſeat of arts and commerce at that time. In purſuit of theſe chimerical projects, they ſold at the loweſt price their ancient caſtles and inheritances, which had now loſt all value in their eyes. The infirm and aged contributed to the expedition by preſents and money; and many of them, not ſatisfied with this, attended it in perſon, being determined, if poſſible, to breathe their laſt in ſight of that city where their Saviour had died for them. Women themſelves, concealing their ſex under the diſguiſe of armour, attended the camp; and commonly forgot their duty ſtill more, by proſtituting themſelves to the army. The greateſt criminals were forward in a ſervice which they conſidered as an expiation for all crimes; and the moſt enormous diſorders were, during the courſe of theſe expeditions, committed by men inured to wickedneſs, encouraged by example, and impelled by neceſſity. The multitude of adventurers ſoon became ſo great, that their more ſagacious leaders became apprehenſive leſt the greatneſs of the armament would be the cauſe of its own diſappointment. For this reaſon they permitted an undiſciplined multitude, computed at 300,000 men, to go before them under the command of Peter the hermit, and Gautier or Walter, ſurnamed the *moneyleſs*, from his being a ſoldier of fortune. Theſe took the road towards Conſtantinople through Hungary and Bulgaria; and, truſting that heaven, by ſupernatural aſſiſtance, would ſupply all their neceſſities, they made no proviſion for ſubſiſtence in their march. They ſoon found themſelves obliged to obtain by plunder what they vainly expected from miracles; and the enraged inhabitants of the countries through which they paſſed, attacked the diſorderly multitude, and ſlaughtered them without reſiſtance. The more diſciplined armies followed after; and, paſſing the ſtraits of Conſtantinople, they were muſtered in the plains of Aſia, and amounted in the whole to 700,000 men.

The rage for conquering the Holy Land did not ceaſe with this expedition. It continued for very near two centuries, and eight different croiſades were ſet on foot, one after another. The firſt was in the year 1069, as already obſerved. The princes engaged in it were, Hugo, count of Vermandois, brother to Philip I. king of France; Robert, duke of Normandy; Robert, earl of Flanders; Raimond, earl of Toulouſe and St Giles; Godfrey of Bouillon, duke of Lorrain, with his brothers Baldwin and Euſtace; Stephen, earl of Chartres and Blois; Hugo, count of St Paul; with a great number of other lords. The general rendezvous was at Conſtantinople. In this expedition, the famous Godfrey beſieged and took the city of Nice. The city of Jeruſalem was taken by the confederated army, and Godfrey choſen king. The Chriſtians gained the famous battle of Aſcalon againſt the ſoldan of Egypt; which put an end to the firſt croiſade.

The ſecond croiſade, in the year 1144, was headed by the emperor Conrad III. and Louis VII. king of France. The emperor's army was either deſtroyed by the enemy, or periſhed through the treachery of Manuel the Greek emperor; and the ſecond army, through the unfaithfulneſs of the Chriſtians of Syria, was forced to break up the ſiege of Damaſcus.

The third croiſade, in the year 1188, immediately followed the taking of Jeruſalem by Saladin the ſoldan of Egypt. The princes engaged in this expedition were, the emperor Frederic Barbaroſſa; Frederic duke of Suabia, his ſecond ſon; Leopold duke of Auſtria; Berthold duke of Moravia; Herman marquis of Baden; the counts of Naſſau, Thuringia, Miſſer, and Holland; and above 60 other princes of the empire; with the biſhops of Beſançon, Cambray, Munſter, Oſnaburgh, Miſſen, Paſſau, Viſburg, and ſeveral others. In this expedition, the emperor Frederic defeated the ſoldan of Iconium: his ſon Frederic, joined by Guy Luſignan king of Jeruſalem, in vain endeavoured to take Acre or Ptolemais. During which tranſactions, Philip Auguſtus king of France, and Richard I. king of England, joined the croiſade; by which means the Chriſtian army conſiſted of 300,000 fighting men: but great diſputes happening between the kings of France and England, the former quitted the Holy Land, and Richard concluded a peace with Saladin.

The fourth croiſade was undertaken, in the year 1195, by the emperor Henry VI. after Saladin's death. In this expedition the Chriſtians gained ſeveral battles againſt the infidels, took a great many towns, and were in the way of ſucceſs, when the death of the emperor obliged them to quit the Holy Land, and return into Germany.

The fifth croiſade was publiſhed, by order of Pope Innocent III. in 1198. Thoſe engaged in it made fruitleſs efforts for the recovery of the Holy Land; for, though John de Neule, who commanded the fleet equipped in Flanders, arrived at Ptolemais a little after Simon of Montfort, Reynard of Dampierre, and others; yet the plague deſtroying many of them, and the reſt either returning, or engaging in the petty quarrels of the Chriſtian princes, there was nothing done; ſo that the ſoldan of Aleppo eaſily defeated their troops in 1204.

The ſixth croiſade began in 1228; in which the Chriſtians took the town of Damietta, but were forced to ſurrender it again. The next year the emperor Frederic made peace with the ſoldan for 10 years. About 1240, Richard earl of Cornwall, and brother to Henry III. king of England, arrived in Paleſtine at the head of the Engliſh croiſade: but finding it moſt advantageous to conclude a peace, he reembarked, and ſteered towards Italy. In 1244, the Karaſmians being driven out of Perſia by the Tartars, broke into Paleſtine, and gave the Chriſtians a general defeat near Gaza.

The ſeventh croiſade was headed by St Lewis, in the year 1249, who took the town of Damietta: but a ſickneſs happening in the Chriſtian army, the king endeavoured to retreat; in which being purſued by the infidels, moſt of his army were miſerably butchered, and himſelf and the nobility taken priſoners. Then a truce was agreed upon for 10 years, and the king and lords ſet at liberty.

The eighth croiſade, in 1270, was headed by the ſame prince, who made himſelf maſter of the port and caſtle of Carthage in Africa; but dying in a ſhort time, he left his army in a very ill condition. Soon after, the king of Sicily coming up with a good fleet, and joining Philip the Bold, ſon and ſucceſſor of Lewis, the king of Tunis, after ſeveral engagements with the Chriſtians, in which he was always worſted, deſired peace, which was granted upon conditions advantageous to the Chriſtians: after which both princes embarked for their own kingdoms. Prince Edward of England, who arrived at Tunis at the time of this treaty, ſailed towards Ptolemais, where he landed with a ſmall body of 300 Engliſh and French, and hindered Bendocdar from laying ſiege to Ptolemais: but being obliged to quit the Holy Land to take poſſeſſion of the crown of England, this croiſade ended without contributing any thing to the recovery of the Holy Land. In 1291, the town of Acre, or Ptolemais, was taken and plundered by the ſoldan of Egypt, and the Chriſtians quite driven out of Syria. There has been no croiſade ſince that time, though ſeveral popes have attempted to ſtir up the Chriſtians to ſuch an undertaking; particularly Nicholas IV. in 1292, and Clement V. in 1311.

Though theſe croiſades were effects of the moſt abſurd ſuperſtition, they tended greatly to promote the good of Europe. Multitudes indeed were deſtroyed. M. Voltaire computes the people who periſhed in the different expeditions at upwards of two millions. Many there were, however, who returned; and theſe having converſed ſo long with people who lived in a much more magnificent way than themſelves, began to entertain ſome taſte for a refined and poliſhed way of life. Thus the barbariſm in which Europe had been ſo long immerſed, began to wear off ſoon after this time. The princes alſo who remained at home, found means to avail themſelves of the frenzy of the people. By the abſence of ſuch numbers of reſtleſs and martial adventurers, peace was eſtabliſhed in their dominions. They alſo took the opportunity of annexing to their crown many conſiderable fiefs, either by purchaſe, or by the extinction of the heirs; and thus the miſchiefs which muſt always attend feudal governments were conſiderably leſſened.

With regard to the bad ſucceſs of the croiſaders, it was ſcarce poſſible that any other thing could happen them. The emperors of Conſtantinople, inſtead of aſſiſting, did all in their power to diſconcert their ſchemes. They were jealous, and not without reaſon, of ſuch an inundation of barbarians. Yet, had they conſidered their true intereſt, they would rather have aſſiſted them, or at leaſt ſtood neuter, than entered into alliances with the Turks. They followed the latter method, however, and were often of very great diſſervice to the weſtern adventurers, which at laſt occaſioned the loſs of their city *. But the worſt enemies the croiſaders had, were their own internal feuds and diſſenſions. They neither could agree while marching together in armies with a view to conqueſt, nor could they unite their conqueſts under one government after they had made them. They ſet up three ſmall ſtates, one at Jeruſalem, another at Antioch, and another at Edeſſa. Theſe ſtates, inſtead of aſſiſting, made war upon each other, and on the Greek emperors; and thus became an eaſy prey to the common enemy. The horrid cruelties they committed alſo were ſuch as muſt have inſpired the Turks with the moſt invincible hatred againſt them, and made them reſiſt with the greateſt obſtinacy. They were ſuch as could have been committed only by barbarians inflamed with religious enthuſiaſm. When Jeruſalem was taken, not only the numerous garriſon were put to the ſword, but the inhabitants were maſſacred without mercy and without diſtinction. No age or ſex was ſpared, even children at the breaſt were barbarouſly murdered. According to Voltaire, ſome Chriſtians, who had been ſuffered by the Turks to live in that city, led the conquerors into the moſt private caves where women had concealed themſelves with their children, and not one of them was ſuffered to eſcape. What eminently ſhows the enthuſiaſm with which theſe conquerors were animated, is their behaviour after this terrible ſlaughter. They marched over heaps of dead bodies towards the holy ſepulchre; and while their hands were yet polluted with the blood of ſo many innocent perſons, ſung anthems to the common Saviour of mankind. Nay, ſo far did their religious enthuſiaſm overcome their fury, that theſe ferocious conquerors now burſt into tears. If the abſurdity and wickedneſs of this conduct can be exceeded by any thing, it muſt be by what follows. In the year 1204, the frenzy of croiſading ſeized the children, who are ever ready to imitate what they ſee their parents engage themſelves in. Their childiſh folly was encouraged by the monks and ſchoolmaſters; and thouſands of thoſe innocents were conducted from the houſes of their parents on the faith of theſe words, "Out of the mouth of babes and ſucklings haſt thou perfected praiſe." Their baſe conductors ſold a part of them to the Turks, and the reſt periſhed miſerably.

CROISES, or CROIZES, in Engliſh antiquity, pilgrims bound for the Holy Land, or ſuch as had been there; ſo called from a badge they wore in imitation of a croſs. The knights of St John of Jeruſalem, created for the defence and protection of pilgrims, were particularly called *croiſes*.

CROISERS, a religious order founded in honour of the invention or diſcovery of the croſs by the empreſs Helena. They are diſperſed in ſeveral parts of Europe, particularly in the Low Countries, France, and Bohemia, thoſe in Italy being at preſent ſuppreſſed. Theſe religious follow the rule of St Auguſtine. They had in England the name of *crouched friars*.

CROIX, FRANCIS PETIS DE LA, ſecretary and interpreter to the king of France in the Turkiſh and Arabic languages, died November 4. 1695, in his 73d year; after having executed this employment for the ſpace of 44 years. And it appears, that he executed it with as much integrity as abilities; for, when the Algerines ſought for peace of Louis XIV. conditions were offered, by which they were required to reimburſe to this monarch 600,000 franks. The terms being thought exorbitant, they had recourſe to ſtratagem; and they offered a large ſum to La Croix, who was the interpreter of all that paſſed, if he would put into the treaty "crowns of Tripoli," inſtead of "French crowns; which would have made to the Algerines a difference of more than 100,000 livres. But the integrity of the interpreter triumphed over the temptation; which however was the greater, as it was next to impoſſible he ſhould be diſcovered. Beſides the Turkiſh and the Arabic, the Perſian and the Tartarian, he alſo underſtood the Ethiopian and Armenian languages. He is well known to the learned world by many works. He tranſlated the "Hiſtory of France" into the Turkiſh language. He digeſted the three volumes of "Voyages into the Eaſt Indies" of M. Thevenot. He made an accurate catalogue of all the Turkiſh and Perſian books which are in the king's library. He compoſed two complete Dictionaries for the French and Turkiſh languages; and, when he was dying, he was about to preſent the world with the hiſtory of Jenghis Khan. He undertook this

* See Conſtantinople, N° 144.

hiſtory by the order of M. Colbert; for this miniſter, altogether intent upon aggrandizing his maſter, was accuſtomed every week to call together, either in the king's library or his own, certain of the learned, whom, according as they excelled in their ſeveral departments in literature, he conſtantly ſet to work. This hiſtory, which coſt La Croix more than ten years labour, is uſeful, not only to the learned who are curious to know paſt events, or to geographers who had hitherto been greatly ignorant of Grand Tartary, but likewiſe to all who trade to China, Perſia, or other eaſtern parts of the world. There is a good map of northern Aſia drawn by M. de l'Iſle, accompanying the work; which M. Petit de la Croix, the author's ſon, not only reviſed, but, to render it more curious, added to it an abridgement of the lives of all thoſe authors from whom it was extracted. It was tranſlated into Engliſh, and publiſhed at London, 1722, 8vo.

CROMARTY, a town of Scotland capital of the county of the ſame name. The town is ſmall, and ſituated upon a rock or point of land, which overhangs the ſea in a romantic manner, and is much expoſed to the eaſt wind; it was formerly a royal borough, but was disfranchiſed by an act of the privy council of Scotland, in conſequence of a petition for that purpoſe preſented by Sir John Urquhart, proprietor of the eſtate of Cromarty; it is now under the baronial juriſdiction of the earl of Cromarty. The pariſh extends about ſeven miles in length, and from one to four in breadth, bounded by the frith of Cromarty on the north. On the banks of the frith the ſurface is level, and covered with verdure. A bank about two miles from the coaſt, extends the whole length of the pariſh, above which the ground is covered with heath and moſs. The ſoil is everywhere wet and mooriſh, which makes the ſeaſons late, and the crop uncertain. The coaſt towards the eaſt is bold and rocky, ſome of the cliffs being nearly 250 feet perpendicular to the ſea; the reſt is flat and ſandy. After every ſtorm a great quantity of ſea weed is thrown aſhore, which is partly uſed as a manure, and partly burnt into kelp, of which there is annually made about 10 or 12 tons. The harbour of Cromarty, inferior, perhaps, to none in Britain for ſafety, and a commodious quay, was lately built at the joint expence of government and the proprietor of the eſtate of Cromarty, where veſſels of 350 or 400 tons may lie in perfect ſecurity. A conſiderable trade in the hempen or ſack-cloth line has been long eſtabliſhed in Cromarty and the neighbourhood.

CROMARTY, *County of*, in Scotland, forms a kind of peninſula, waſhed on three ſides by the friths of Cromarty and Moray, and bounded on the ſouthweſt and ſouth by the county of Roſs. Its extreme extent in length is about 16 miles, and on an average about ſix and a half or ſeven in breadth. It was erected into a diſtinct county about the end of the 17th century, at the requeſt of Sir James M'Kenzie, earl of Cromarty, to whom it almoſt entirely belonged. The face of the country is pleaſant; a long ridge of hills extending the whole length in the middle of the county, having a fine declivity on either ſide towards the ſhores of the friths. The higher grounds are moſtly covered with heath, but towards the ſhores the ſoils are light and early. A great many plantations have been lately made out, which will ſhortly be a great ornament and ſhelter to the country. The language is generally Gaelic, but many ſpeak that broad Scotch, which is commonly called the Buchan or Aberdeenſhire dialect. Freeſtone, granite, and reddiſh-coloured porphyry, are almoſt the only minerals, if we except *topazes*, ſimilar to thoſe of *Cairngorum*, found in the pariſh of Kincardine. Fiſheries are very ſucceſsfully carried on, and pearls of conſiderable value are ſometimes found in the frith of Cromarty, where the river *Conal* falls into that bay.

Population of the County of Cromarty at two different periods.

Pariſhes.	Population in 1755.	Population in 1790—1798.
Cromarty	2096	2184
Fodderty	1483	1730
Tarbat	1584	1370
	5163	5284
		5163
	Increaſe	121

CROMARTY, *Frith of*, is one of the fineſt bays in Great Britain; hence called by Buchanan *Portus Salutis*. It is divided from the Moray frith by the county of Cromarty, and waſhes the ſouthern ſhore of the county of Roſs. It is about 16 miles in length, and ſometimes three in breadth. The entrance is between two promontories or headlands, called the *Sutors of Cromarty*, which are about a mile and a half diſtant: there is the fineſt anchorage ground after paſſing the *Sutors*, for ſeveral miles up the bay, with deep water on both ſides, almoſt cloſe to the ſhore, where in moſt places the coaſt is ſo ſmooth, that ſuppoſing a veſſel to part her cables (a thing ſcarcely probable), ſhe might run aground without ſuſtaining much damage. Such is the extent of ſea-room in the bay, and ſuch is the capacity, that almoſt the whole Britiſh navy might lie here in ſafety.

CROMLECH, in Britiſh antiquities, are huge, broad, flat ſtones, raiſed upon other ſtones ſet up on end for that purpoſe. They are common in ANGLESEA; under which article a very large one is deſcribed. See Plate CLXIV.

Theſe monuments are ſpoken of largely by Mr Rowland, by Dr Borlaſe, and by Wormius, under the name of *Ara* or altar. Mr Rowland, however, is divided in his opinion; for he partly inclines to the notion of their having been altars, partly to their having been ſepulchres: he ſuppoſes them to have been originally tombs, but that in after times ſacrifices were performed upon them to the heroes depoſited within. Mr Keiller preſerves an account of King Harold having been interred beneath a tomb of this kind in Denmark, and Mr Wright diſcovered in Ireland a ſkeleton depoſited under one of them. The great ſimilarity of the monuments throughout the north, Mr Pennant obſerves, evinces the ſame religion to have been ſpread in every part, perhaps with ſome ſlight deviations. Many of theſe monuments are both Britiſh and Daniſh; for we find them where the Danes never penetrated.

The cromlech, or cromleh, chiefly differs from the *Kist-vaen*, in not being cloſed up at the end and ſides, that is, in not ſo much partaking of the cheſt-like figure; it is alſo generally of larger dimenſions, and ſometimes conſiſts of a greater number of ſtones: the terms *cromleh* and *kiſt-vaen* are however indiſcriminately uſed for the ſame monument. The term *cromlech* is by ſome derived from the Armoric word *crum*, "crooked or bowing," and *leh* "ſtone," alluding to the reverence which perſons paid to them by bowing. Rowland derives it from the Hebrew words *carem-luach*, ſignifying a "devoted or conſecrated ſtone." They are called by the vulgar *coetne Arthor*, or *Arthur's quoits*, it being a cuſtom in Wales as well as Cornwall to aſcribe all great or wonderful objects to Prince Arthur, the hero of thoſe countries.

CROMWELL, THOMAS, earl of Eſſex, was the ſon of a blackſmith at Putney, and born in 1498. Without a liberal education, but endowed with a ſtrong natural genius, he conſidered travelling as the proper means of improving his underſtanding; and to this early token of his ſound judgment he ſtood indebted for the high rank and diſtinguiſhed honours he afterwards enjoyed. He became by degrees the confidential favourite and prime miniſter of Henry VIII.; and from the moment he acquired any authority in the cabinet, he employed it in promoting the reformation, to his zeal for which he became a victim; for, the more firmly to ſecure the Proteſtant cauſe, he contrived to marry the king to Ann of Cleves, whoſe friends were all Lutherans. Unfortunately Henry took a diſguſt at this lady, which brought on Cromwell's ruin; the king, with his uſual cruelty and caprice, taking this opportunity to ſacrifice this miniſter to the Roman Catholic party, to whom he ſeemed deſirous of reconciling himſelf as ſoon as he had Catharine Howard in view. Cromwell was a great politician, and a good man; but, like moſt ſtateſmen, was guilty of great errors. In his zeal for the new religion, he had introduced the unjuſtifiable mode of attainder in caſes of treaſon and hereſy; and his enemies, who were numerous (conſiſting of two claſſes, the ancient nobility and gentry, who were enraged to ſee the higheſt honours beſtowed on a man of mean extraction, and the Roman Catholics, who deteſted him), having preferred many complaints againſt him, availed themſelves of his own law. He was attainted of treaſon and hereſy, convicted unheard, and beheaded in 1540. He was the chief inſtrument of the ſuppreſſion of the abbeys and monaſteries, and of the deſtruction of images and relics; to him alſo we are indebted for the inſtitution of pariſh-regiſters of births, marriages, and burials.

CROMWELL, *Oliver*, ſtiled *Lord Protector* of the commonwealth of England, one of the moſt extraordinary perſonages mentioned in hiſtory, was the ſon of Mr Robert Cromwell of Hinchinbrooke in the county of Huntingdon. His anceſtors were of very honourable extraction; but no ways related to Thomas Cromwell earl of Eſſex, the prime miniſter and favourite of Henry VIII. He was born in the pariſh of St John, Huntingdon, where his father moſtly lived, on the 25th or 26th of April 1599, and educated at the free ſchool of that town. Little is known concerning him in his younger years, or indeed concerning his behaviour in private life. It is however, related by authors of unſuſpected veracity, that when at ſchool he gave many ſigns of a very turbulent and reſtleſs diſpoſition. He is alſo ſaid from his early years to have been ſubject to the hypochondriac diſorder, and to many deceptions of the imagination. He had a very remarkable one while at ſchool. It happened in the day-time, when he was lying melancholy upon his back in bed. A ſpectre, as he thought, approached him, and told him that he ſhould be the greateſt man in the kingdom. His father, being informed of this, was very angry, and deſired his maſter to correct him ſeverely. This, however, produced no effect. Oliver perſiſted in the truth of his ſtory, and would ſometimes mention it, though his uncle told him "it was too traiterous to be repeated."—From this ſchool Oliver was removed to Sidney college in Cambridge, where he was admitted in 1616. His progreſs in his ſtudies is uncertain; but he ſpent much time in playing at foot-ball, cricket, and other robuſt exerciſes, at which he was very expert. His father dying after he had been about two years at colledge, Cromwell returned home; but the irregularity of his life gave ſuch offence to his mother, that, by the advice of ſome friends, ſhe ſent him to London, and placed him in Lincoln's-inn. This expedient by no means anſwered the purpoſe; her ſon gave himſelf up to gaming, wine, and women, ſo that he quickly diſſipated all that was left him by his father. This diſſipation, however, could be but of very ſhort continuance; for he was married, before he was 21 years of age, to Elizabeth daughter of Sir James Bouchier of Eſſex. Soon after his marriage he returned to the country, where he led a very grave and ſober life. This ſudden reformation has been aſcribed to his falling in with the Puritans; but it is certain, that Mr Cromwell continued then, and for ſome time after, a zealous member of the church of England, and formed a cloſe friendſhip with ſeveral eminent divines. He continued at Huntingdon, where he ſettled after his marriage, till an eſtate of between 400l. and 500l. per annum devolved on him by the death of his uncle Sir Thomas Stuart. This induced him to remove to the iſle of Ely where the eſtate lay, and here he embraced the puritanical doctrines. He was elected a member of the third parliament of Charles I. which met on the 10th of January 1628; and was a member of the committee for religion, where he diſtinguiſhed himſelf by his zeal againſt popery. After the diſſolution of that parliament, he returned again into the country, where he continued to expreſs much concern for religion, to keep company with ſilenced miniſters, and to invite them often to lectures and ſermons at his houſe. Thus he brought his affairs again into a very indifferent ſituation: ſo that, by way of repairing the breaches he made in his fortune, he took a farm at St Ives, which he kept five years. But this ſcheme ſucceeded ſo ill, that he was obliged to give it up; and at laſt, chagrined with his diſappointments, and made uneaſy by the treatment his party at that time received, he formed a deſign of going over to New England. In this, however, he was diſappointed; the king iſſued out a proclamation againſt all ſuch emigrations, and Cromwell was obliged to remain in England againſt his will.

In 1638, Cromwell had firſt an opportunity of getting himſelf publicly taken notice of. The earl of

Bedford, and ſome other perſons of high rank, who had eſtates in the fen country, were very deſirous of having it better drained; and though one project of this ſort had failed, they ſet on foot another, got it countenanced by royal authority, and ſettled a part of the profits upon the crown. This, though really intended for a public benefit, was oppoſed as injurious to private property: and at the head of the oppoſers was Mr Oliver Cromwell, who had conſiderable influence in theſe parts. The vigour he ſhowed on this occaſion recommended him to his friend and relation Mr Hampden; who afterwards characterized him in parliament, as a perſon capable of contriving and conducting great deſigns. But for all this he was not very ſucceſsful in his oppoſition; and as his private affairs were ſtill declining, he was in very neceſſitous circumſtances at the approach of the long parliament. In this critical ſituation he got himſelf elected member of parliament in the following manner. In the puritanical meetings which he conſtantly frequented, Oliver had moſt eminently diſtinguiſhed himſelf by his *gifts* of praying, preaching, and expounding. At one of theſe meetings he met with one Richard Tims, a tradeſman of Cambridge. This man was ſo much taken with Oliver, that he took it into his head to attempt getting him choſen burgeſs for the approaching parliament. Being himſelf one of the common council, Tims imagined this deſign might be brought about; and with this view went to Mr Wildbore a relation of Cromwell's, to whom he communicated his intention. Wildbore agreed as to the fitneſs of the perſon; but told him the deſign was impracticable, becauſe Oliver was not a freeman. Tims next addreſſed one Evett on the ſame ſubject, who alſo made the ſame objection. He recollected, however, that the mayor had a freedom to beſtow, and a ſcheme was immediately laid for ſecuring this freedom to Cromwell. On application to the mayor, however, he told them that the freedom was already diſpoſed of to another; but this objection being obviated by promiſing that perſon a freedom from the town, the mayor being informed that Cromwell was a man of great fortune, ſignified his intention of beſtowing the freedom upon him. Our hero being informed of the good offices of his friends, made his appearance in the court dreſſed in ſcarlet richly laced with gold, and having provided plenty of claret and ſweetmeats, they were ſo freely circulated among the corporation, that Mr Mayor's freeman was unanimouſly declared to be a very civil worthy gentleman. When the election came on, the mayor diſcovered his miſtake, but it was now too late; the party among the burgeſſes was ſtrong enough to chooſe him, and accordingly did ſo at the election next year.

When Cromwell firſt came into parliament, he affected great plainneſs, and even careleſſneſs in his dreſs. His attention to farming had entirely ruſticated him, ſo that he made a very uncouth appearance. "Who (ſays Dr South) that had beheld ſuch a bankrupt, beggarly fellow, as Cromwell, firſt entering the parliament houſe, with a thread-bare torn coat and greaſy hat, and perhaps neither of them paid for, could have ſuſpected, that, in the ſpace of ſo few years, he ſhould, by the murder of one king, and the baniſhment of another, aſcend the throne, be inveſted with the royal robes, and want nothing of the ſtate of a king but the changing his hat into a crown?" Cromwell was very active in promoting the famous *Remonſtrance*[*]; which in reality laid the foundation of the civil war. He declared afterwards to Lord Falkland, that if the remonſtrance had not been carried, he deſigned to have converted the ſmall remains of his eſtate into ready money the next day, and to have left the kingdom by the firſt opportunity. His firmneſs on this occaſion ſo effectually recommended him to Hampden, Pym, and the other leaders of the popular party, that they took him into all their councils; and here he acquired that clear inſight into things, and that knowledge of men, of which he afterwards made ſuch prodigious uſe. His exploits during the civil war, his murder of the king, and uſurpation of the kingdom, are related under the article BRITAIN, N° 127—188.

With regard to the character of Cromwell, Mr Hume expreſſes himſelf as follows: "The writers attached to this wonderful perſon make his character, with regard to abilities, bear the air of the moſt extravagant panegyric: his enemies form ſuch a repreſentation of his moral qualities as reſembles the moſt virulent invective. Both of them, it muſt be confeſſed, are ſupported by ſuch ſtriking circumſtances in his fortune and conduct, as beſtow on their repreſentation a great air of probability. 'What can be more extraordinary (it is ſaid), than that a perſon of private birth and education, no fortune, no eminent qualities of body, which have ſometimes, nor ſhining qualities of mind, which have often, raiſed men to the higheſt dignities, ſhould have the courage to attempt, and the abilities to execute, ſo great a deſign as the ſubverting one of the moſt ancient as well as beſt eſtabliſhed monarchies in the world? That he ſhould have the power and boldneſs to put his prince and maſter to an open and infamous death? ſhould baniſh that numerous and ſtrongly allied family—cover all theſe temerities under a ſeeming obedience to a parliament, in whoſe ſervice he pretended to be retained—trample too upon that parliament in their turn, and ſcornfully expel them as ſoon as they gave him ground of diſſatisfaction—erect in their place the dominion of the ſaints, and give reality to the moſt viſionary idea which the heated imagination of any fanatic was ever able to entertain—ſuppreſs again that monſter in its infancy, and openly ſet himſelf up above all things that ever were called *ſovereign* in England—overcome firſt all his enemies by arms, and all his friends afterwards by artifice—ſerve all parties patiently for a while, and afterwards command them victoriouſly at laſt—overrun each corner of the three nations, and ſubdue with equal facility both the riches of the ſouth, and the poverty of the north—be feared and courted by all princes, and adopted a brother to the gods of the earth—call together parliaments with a word of his pen, and ſcatter them again by the breath of his mouth—reduce to ſubjection a warlike and diſcontented nation by means of a mutinous army—command a mutinous army by means of ſeditious and factious officers—be humbly and daily petitioned, that he would be pleaſed, at the rate of millions a-year, to be hired as maſter of thoſe who had formerly hired him for their ſervant—have the eſtates and

[*] See Br tain.

and lives of three nations as much at his diſpoſal as was once the little inheritance of his father, and be as noble and liberal in the ſpending of them? And, laſtly, (for there is no end of enumerating every particular of his glory), with one word bequeath all this power and ſplendour to his poſterity—die poſſeſſed of peace at home, and triumph abroad—be buried among kings, and with more than regal ſolemnity, and leave a name behind him not to be extinguiſhed but with the whole world; which, as it was too little for his praiſe, ſo it might have been for his conqueſts, if the ſhort line of his mortal life could have ſtretched out to the extent of his immortal deſigns?

"My intention is not to disfigure this picture drawn by ſo maſterly a hand; I ſhall only endeavour to remove from it ſomewhat of the marvellous; a circumſtance which, on all occaſions, gives much ground for doubt and ſuſpicion. It ſeems to me that the circumſtance of Cromwell's life in which his abilities are principally diſcovered, is his riſing, from a private ſtation, in oppoſition to ſo many rivals, ſo much advanced before him, to a high command and authority in the army. His great courage, his ſignal military talents, his eminent dexterity and addreſs, were all requiſite for this important acquiſition. Yet will not this promotion appear the effect of ſupernatural abilities, when we conſider that Fairfax himſelf, a private gentleman, who had not the advantage of a ſeat in parliament, had through the ſame ſteps attained even to a ſuperior rank; and, if endued with common capacity and penetration, had been able to retain it. To incite ſuch an army to rebellion againſt the parliament, required no uncommon art or induſtry: to have kept them in obedience had been the more difficult enterpriſe. When the breach is once formed between the military and civil powers, a ſupreme and abſolute authority, from that moment, is devolved on the general; and if he is afterwards pleaſed to employ artifice or policy, it may be regarded on moſt occaſions as great condeſcenſion, if not as ſuperfluous caution. That Cromwell was ever able really to blind or overreach either the king or the republicans, does not appear: as they poſſeſſed no means of reſiſting the force under his command, they were glad to temporize with him; and, by ſeeming to be deceived, to wait for an opportunity of freeing themſelves from his dominion. If he ſeduced the military fanatics, it is to be conſidered that their intereſt and his evidently concurred; that their ignorance and low education expoſed them to the groſſeſt impoſition; and that he himſelf was at bottom as frantic an enthuſiaſt as the worſt of them; and in order to obtain their confidence, needed but to diſplay thoſe vulgar and ridiculous habits which he had early acquired, and on which he ſet ſo high a value. An army is ſo forcible, and at the ſame time ſo coarſe a weapon, that any hand which wields it, may, without much dexterity, perform any operation, and attain any aſcendant in human ſociety.

"The domeſtic adminiſtration of Cromwell, though it diſcovers great ability, was conducted without any plan either of liberty or arbitrary power: perhaps his difficult ſituation admitted of neither. His foreign enterpriſes, though full of intrepidity, were pernicious to national intereſt; and ſeem more the reſult of impetuous fury or narrow prejudices, than of cool foreſight and deliberation. An eminent perſonage, however, he was in many reſpects, and even a ſuperior genius; but unequal and irregular in his operations: and, though not defective in any talent except that of elocution, the abilities which in him were moſt admirable, and which contributed moſt to his marvellous ſucceſs, were the magnanimous reſolution of his enterpriſes, and his peculiar dexterity in diſcovering the characters and practiſing on the weakneſſes of mankind.

"If we ſurvey the moral character of Cromwell, with that indulgence which is due to the blindneſs and infirmities of the human ſpecies, we ſhall not be inclined to load his memory with ſuch violent reproaches as thoſe which his enemies uſually throw upon it. Amidſt the paſſions and prejudices of that time, that he ſhould prefer the parliamentary to the royal cauſe, will not appear extraordinary; ſince even at preſent many men of ſenſe and knowledge are diſpoſed to think, that the queſtion, with regard to the juſtice of the quarrel, may be regarded as doubtful and ambiguous. The murder of the king, the moſt atrocious of all his actions, was to him covered under a mighty cloud of republican and fanatical illuſions; and it is not impoſſible but he might believe it, as many others did, the moſt meritorious action which he could perform. His ſubſequent uſurpation was the effect of neceſſity, as well as of ambition; nor is it eaſy to ſee how the various factions could at that time have been reſtrained without a mixture of military and arbitrary authority. The private deportment of Cromwell as a ſon, a huſband, a father, a friend, is expoſed to no conſiderable cenſure, if it does not rather merit praiſe. And, upon the whole, his character does not appear more extraordinary and unuſual by the mixture of ſo much abſurdity with ſo much penetration, than by his tempering ſuch violent ambition and ſuch enraged fanaticiſm with ſo much regard to juſtice and humanity."

That Cromwell continued a moſt complete and bigotted enthuſiaſt to the very laſt, appears from his behaviour in his laſt ſickneſs. His diſeaſe, which at firſt was a kind of ſlow fever, brought on by the cares and anxiety of his mind, ſoon degenerated into a tertian ague. For about a week the diſorder continued without any dangerous ſymptoms, inſomuch that every other day he walked abroad; but one day after dinner his five phyſicians coming to wait upon him, one of them having felt his pulſe, ſaid that it intermitted. At this Cromwell was ſurpriſed, turned pale, fell into a cold ſweat, and, when he was almoſt fainting, ordered himſelf to be carried to bed; where, by the aſſiſtance of cordials, being brought a little to himſelf, he made his will with reſpect to his private affairs. The next morning, when one of his phyſicians came to viſit him, Cromwell aſked him, why he looked ſo ſad? and when anſwer was made that ſo it became every one who had the weighty charge of his life and health upon him, "Ye phyſicians (ſays Cromwell), think I ſhall die: I tell you I ſhall not die this bout, I am ſure of it. Do not you think (ſaid he to the phyſician, looking more attentively at him), do not think that I am mad: I ſpeak the words of truth upon ſurer grounds than your Hippocrates or Galen can furniſh you with. God almighty himſelf hath given that anſwer, not to my prayers alone, but alſo to the prayers of thoſe who entertain a ſtricter commerce and greater intereſt with him. Go on cheerfully, baniſhing all ſadneſs from your looks; and deal with me as you would do with a ſerving man. Ye may have a ſkill in the nature of things, yet nature can do more than all phyſicians, put together, and God is far more above nature." As this phyſician was coming out of the chamber, he accidentally met with another, to whom he expreſſed his fear that the protector was turning light-headed. But the other informed him that the chaplains, being diſperſed the preceding night into different parts of the houſe, had prayed for the protector's recovery, and unanimouſly received for anſwer that he ſhould recover. Nay, to ſuch a degree of madneſs did they at laſt arrive, that, a public faſt being kept at Hampton court, they did not ſo much pray to God for the protector's health, as return thanks for the undoubted pledges they had of his recovery. On this account, though the phyſicians perceived his diſtemper increaſing every hour, they took no notice of his danger, till it became neceſſary for him to appoint a ſucceſſor while he had any breath remaining. But being then in a lethargic fit, he anſwered from the purpoſe; upon which he was again aſked whether he did not name his eldeſt ſon Richard? and to this queſtion he anſwered, Yes. Being then aſked where his will was which he had formerly made concerning the heirs of the kingdom: he ſent to look for it in his cloſet and other places, but in vain; for ſomebody had either ſtolen it, or he himſelf had burnt it. Soon after, he expired, on the 3d of September 1658, aged ſomewhat more than 59 years and four months. This day of September he had always reckoned to be the moſt fortunate for him in the whole year. A violent tempeſt, which immediately ſucceeded his death, ſerved as a ſubject of diſcourſe to the vulgar. His partizans, as well as his opponents, were fond of remarking this event; and each of them endeavoured, by forced inferences, to interpret it as beſt ſuited their particular prejudices.

It has been imagined by ſome, that Oliver Cromwell was poiſoned: but for this there ſeems to be no reaſonable foundation. His body was opened by Dr Bates. He found the brain ſomewhat overcharged with blood, and the lungs a little inflamed; but what he reckoned to have been the principal cauſe of his diſorder was a total degeneracy of the ſubſtance of his ſpleen into a matter reſembling the lees of oil. This, he thought, alſo accounted for the hypochondriac diſpoſitions to which Cromwell had from his infancy been ſubject. Though the bowels were taken out, and the body filled with ſpices wrapped in a fourfold cere cloth, put firſt into a coffin of lead, and then into one of wood, yet the corruption was ſo great that the humour wrought itſelf through the whole, and there was a neceſſity of interring the body before the ſolemnity of the funeral. A very pompous funeral was ordered at the public expence, and performed from Somerſet-houſe, with a ſplendour not only equal but ſuperior to that beſtowed upon crowned heads. Some have related that his body was depoſited in Naſeby-field; others, that it was wrapped in lead, and ſunk in the deepeſt part of the Thames, to prevent any inſult that might afterwards be offered to it. But it ſeems beyond doubt that his body was interred at Weſtminſter: as we are informed, that on the order to diſinter him after the Reſtoration, his corpſe was found in a vault in the middle aiſle of Henry VII.'s chapel. In the inſide of the coffin, and on the breaſt of the corpſe, was laid a copper plate finely gilt, encloſed in a thin caſe of lead. On one ſide of this plate were engraven the arms of England impaled with thoſe of Oliver, and on the reverſe the following legend: *Oliverius Protector Reipublicæ Angliæ, Scotiæ, et Hiberniæ, natus* 25. *Aprilis* 1599, *inauguratus* 16. *Decembris* 1653, *mortuus* 3. *Septembris ann.* 1658, *hic ſitus eſt.*

Cromwell was of a robuſt frame of body, and of a manly, though not agreeable aſpect. His noſe being remarkably red and ſhining, was often made the ſubject of ridicule. He left only two ſons, Richard and Henry: and three daughters; one married to General Fleetwood, another to Lord Fauconberg, and a third to Lord Rich. His mother lived till after he was protector; and contrary to her orders he buried her with great pomp in Weſtminſter abbey. She could not be perſuaded that ever his power or his perſon was in ſafety. At every noiſe ſhe heard ſhe would exclaim that her ſon was murdered; and was never ſatisfied that he was alive if ſhe did not receive frequent viſits from him. She was a decent woman; and by her frugality and induſtry had raiſed and educated a numerous family upon a ſmall fortune. She had even been obliged to ſet up a brewery at Huntingdon, which ſhe managed to good advantage. Hence Cromwell, in the invectives of that age, is often ſtigmatized with the name of brewer. Ludlow, by way of inſult, mentions the great acceſſion which he would receive to his royal revenues upon his mother's death, who poſſeſſed a jointure of 60 pounds a-year upon his eſtate. She was of a good family, of the name of Stuart; and is by ſome ſuppoſed to have been remotely allied to the royal family.

CROMWELL, *Richard*, eldeſt ſon of Oliver Cromwell, was by his father appointed ſucceſſor to the protectorſhip, but very ſoon depoſed by the army*. They diſcharged his debts, took all the houſehold ſtuff, plate, &c. gave him a protection for ſix months, and ſo he retired. He was by no means qualified to ſupport the ſtation gained by the aſpiring talents of his father. He was of a moderate temper, and untainted with that fanatical ſpirit which his father had ſo ſucceſsfully cultivated. On the Reſtoration he went abroad; but returned in 1680 under the aſſumed name of Clark, and ſettled at Cheſhunt in Hertfordſhire, where he lived privately, and died in 1712, aged 86.

* See *Britain*, No. 189, 190.

CRONENBURG, a town of Germany, in the circle of the Upper Rhine, and in the landgraviate of Heſſe Caſſel, with a ſtrong caſtle. It is ſeated at the foot of a high mountain, on a fertile ſoil, and is ſurrounded with a double wall. E. Long. 8. 15. N. Lat. 50. 15.

CRONENBURG, a ſtrong fortreſs of Denmark, in the iſle of Zealand, at the entrance of the Sound, where the Danes take toll of ſuch ſhips as are bound for the Baltic. It was very richly furniſhed, but pillaged by the Swedes in 1658, who took away the furniture, among which were ſome ſtatues of maſſy ſilver. It is built upon piles. E. Long. 12. 50. N. Lat. 56. 0.

CRONIUS, in *Chronology*, the ancient name of the Athenian month Hecatombæon; which was the firſt of their year, and anſwered to the latter part of our June and beginning of July.—There were feaſts called *Cronienes* celebrated at Athens in this month, in honour of Saturn, anſwering to the Saturnalia of the Romans.

CRONSLOT. See Cronstadt.

CRONSTADT, a ſea-port town of Ruſſia, where the greateſt part of the navy is ſtationed. It ſtands upon the iſland of Retuſari in the gulf of Finland; and was founded by Peter I. as being provided with the ſafeſt harbour in theſe parts, and as forming a ſtrong bulwark by ſea for the defence of the new metropolis. The only paſſage by which ſhips of burden can approach Peterſburgh lies on the ſouth ſide of Retuſari, through a narrow channel; one ſide whereof is commanded by Cronſtadt, and the oppoſite by Cronſlot and the citadel. Cronſlot, which ſtands upon a ſmall iſland of ſand, is a circular wooden building, and ſurrounded with fortifications of wood that jut into the water. It contains a garriſon of 100 men. The citadel is another ſmall wooden fortreſs, conſtructed alſo upon an adjacent ſand-bank, and capable of holding about 30 ſoldiers. All large veſſels muſt ſail between Cronſtadt and theſe two fortreſſes, expoſed to the fire of the oppoſite batteries; for the other parts of the gulf are only from one to eleven feet in depth. All theſe fortifications were, at the time of their conſtruction, eſteemed places of conſiderable ſtrength; but now they derive their conſequence more from their paſt importance than from any reſiſtance they could make againſt the attack of a powerful fleet.

Cronſtadt is built upon the ſouth-eaſtern extremity of the iſland, and is defended towards the ſea by wooden piers projecting into the water, and towards the land by ramparts and baſtions. It is a very ſtraggling place; and occupies, like all the Ruſſian towns, a larger ſpace of ground than the number of habitations ſeems to require; the houſes are moſtly of wood excepting a few fronting the harbour, which are of brick ſtuccoed white. Among the latter are the imperial hoſpital for ſailors, the barracks, and the academy for marines and officers of the navy. That ſeminary uſually contains between three and four hundred cadets, who are clothed, maintained, and taught at the expence of the crown. They are admitted at the age of five, and are ſuffered to remain until they reach their ſeventeenth year. They learn accounts, mathematics, drawing, fortification, and navigation; and have maſters in the French, German, Engliſh, and Swediſh, languages. They are trained to naval affairs, and make an annual cruiſe in the Baltic as far as Revel.—Cronſtadt has a ſeparate haven appropriated to the men-of war, and another to merchant ſhips. Cloſe to the haven for merchant ſhips is a canal and ſeveral dry docks, begun in 1719 by Peter I. for the purpoſe of refitting the men of war. This uſeful work was neglected under his ſucceſſors, and was not completed until the reign of his daughter Elizabeth. It has been ſtill further beautified and improved by the preſent empreſs; and is now applied for building as well as careening ſhips of the line. At the extremity of theſe docks is a great reſervoir 568 feet in length, which contains water ſufficient, and half the quantity over, to ſupply all the docks; which is pumped into it by means of a fire engine, the diameter of whoſe cylinder is ſix feet. Tht length of this work, from the beginning of the canal to the end of the laſt dock, is 4221 feet. The ſides of the docks are faced with ſtone, and the bottom is paved with granite. They are 40 feet deep and 150 broad; and are capable of containing nine men of war upon the ſtocks.

CRONSTAT, a town of Tranſylvania, near the frontiers of Moldavia, ſubject to the houſe of Auſtria. E. Long. 25. 0. N. Lat. 47. 0.

CROP, the high part or end of any thing cut off. It is particularly uſed for the corn gathered off a field in harveſt. See Agriculture *Index*.

CROSIER, or Crozier, a ſhepherd's crook; a ſymbol of paſtoral authority, conſiſting of a gold or ſilver ſtaff, crooked at the top, carried occaſionally before biſhops and abbots, and held in the hand when they give the ſolemn benedictions. The cuſtom of bearing a paſtoral ſtaff before biſhops is very ancient, as appears from the life of St Cæſarea of Arles, who lived about the year 500. Among the Greeks none but the patriarchs had a right to the croſier. The croſiers were at firſt no more than ſimple wooden ſtaves in form of a T, uſed to reſt and lean upon. By degrees they were made longer; and at length arrived at the form we now ſee them of. Regular abbots are allowed to officiate with a mitre and croſier.

Crosier, in *Aſtronomy*, four ſtars in the ſouthern hemiſphere in the form of a croſs, ſerving thoſe who ſail in ſouth latitudes to find the antarctic pole.

CROSLET, in *Heraldry*, is when a croſs is croſſed again at a ſmall diſtance from each of the ends. Upton ſays it is not ſo often borne by itſelf in arms as other croſſes are, but often in diminutives, that is, in ſmall croſlets ſcattered about the field. See Heraldry.

CROSS, a gibbet made with two pieces of wood placed croſswiſe, whether they croſs with right angles at the top like a T, or in the middle of their length like an X. The croſs to which our Saviour was faſtened, and on which he died, was of the former kind; being thus repreſented by old monuments, coins, and croſſes; and St Jerome compares it to a bird flying, a man ſwimming, or praying with his arms extended. The puniſhment of the croſs was common among the Syrians, Egyptians, Perſians, Africans, Greeks, Romans, and Jews.

The death of the croſs was the moſt dreadful of all others, both for the ſhame and pain of it; and ſo ſcandalous, that it was inflicted as the laſt mark of deteſtation upon the vileſt of people. It was the puniſhment of robbers and murderers, provided that they were ſlaves too; but otherwiſe, if they were free, and had the privileges of the city of Rome, this was then thought a proſtitution of that honour, and too infamous a puniſhment for ſuch a one, let his crimes be what they would.

The Moſaic law ordained, that the perſons executed ſhould not be left upon the tree after ſunſet, becauſe be that is hanged in this manner is accurſed of God, Deut. xxi. 22. The Jews believe, that the ſouls of thoſe who remain upon the gibbet, and without burial, enjoy no peace, and receive no benefit from the prayers of other people; but wander up and down till their bodies are buried: which agrees with the notions that the Greeks and Romans had of this matter, as may be ſeen in *Hom. Iliad* 4. and *Virg. Æneid* 6.

The form of a croſs being ſuch as has been already deſcribed, the body of the criminal was faſtened to the upright piece by nailing the feet to it, and on the other tranſverſe piece generally by nailing the hands on each ſide. Now, becauſe theſe parts of the body, being the inſtruments of action and motion, are provided by nature with a much greater quantity of nerves than others have occaſion for; and becauſe all ſenſation is performed by the ſpirit contained in theſe nerves; it will follow, as Stanhope obſerves, that wherever they abound, the ſenſe of pain muſt needs in proportion be more quick and tender.

The Jews confeſs, that indeed they crucified people in their nation, but deny that they inflicted this puniſhment upon any one alive. They firſt put them to death, and then faſtened them to the croſs either by the hands or neck. But there are indiſputable proofs of their crucifying men frequently alive. The worſhippers of Baal-peor and the king of Ai were hung up alive; as were alſo the deſcendants of Saul, who were put into the hands of the Gibeonites, 2 Sam. xxi. 9.

Before crucifixion the criminal was generally ſcourged with cords: ſometimes little bones, or pieces of bones, were tied to theſe ſcourges, ſo that the condemned perſon might ſuffer more ſeverely. It was alſo a cuſtom that he who was to be crucified ſhould bear his own croſs to the place of execution. After this manner we find Chriſt was compelled to bear his own croſs; and, as he ſunk under the burden, Simon the Cyrenian was conſtrained to bear it after him and with him. But whereas it is generally ſuppoſed that our Lord bore the whole croſs, i. e. the long and tranſverſe part both, this ſeems to be a thing impoſſible; and therefore Lipſius (in his treatiſe *De Supplicio Crucis*) has ſet the matter in a true light, when he tells us that Jeſus only carried the tranſverſe beam; becauſe the long beam, or the body of the croſs, was either fixed in the ground before, or made ready to be ſet up as ſoon as the priſoner came: and from hence he obſerves, that painters are very much miſtaken in their deſcription of our Saviour carrying the whole croſs.

There were ſeveral ways of crucifying; ſometimes the criminal was faſtened with cords to a tree, ſometimes he was crucified with his head downwards. This way St Peter choſe out of reſpect to his maſter Jeſus Chriſt, not thinking himſelf worthy to be crucified like him; though the common way of crucifying was by faſtening the criminal with nails, one through each hand, and one through both feet, or one through each of them: for this was not always performed in the ſame manner; the ancients ſometimes repreſenting Jeſus Chriſt crucified with four nails, and ſometimes with three. The criminal was fixed to the croſs quite naked; and in all probability the Saviour of the world was not uſed with any greater tenderneſs than others upon whom the puniſhment was inflicted. The ſoldiers divided his clothes among them, and caſt lots for his tunic, which is an under garment worn over the fleſh like a ſhirt.

The text of the goſpel ſhows clearly, that Jeſus Chriſt was faſtened to the croſs with nails; and the Pſalmiſt (xxii. 16.) had foretold long before, that they ſhould pierce his hands and his feet: but there are great diſputes concerning the number of theſe nails. The Greeks repreſent our Saviour as faſtened to the croſs with four nails; in which particular Gregory of Tours agrees with them, one at each hand and foot. But ſeveral are of opinion, that our Saviour's hands and feet were pierced with three nails only, viz. one at each hand, and one through both his feet: and one cuſtom of the Latins is rather for this laſt opinion; for the generality of the old crucifixes made in the Latin church have only three nails. Nonnus thinks that our Saviour's arms were beſides bound faſt to the croſs with chains; and St Hilary ſpeaks of the cords wherewith he was tied to it.

Sometimes they who were faſtened upon the croſs lived a good while in that condition. St Andrew is believed to have continued three days alive upon it. Euſebius ſpeaks of certain martyrs in Egypt who were kept upon the croſs till they were ſtarved to death. Pilate was amazed at Jeſus Chriſt dying ſo ſoon; becauſe naturally he muſt have lived long, if it had not been in his power to have laid down his life and to take it up again. The thighs of the two thieves who were crucified together with our Saviour were broken in order to haſten their death, that their bodies might not remain upon the croſs on the Sabbath-day (John xix. 31, 32. 33.), and to comply with the law of Moſes, which forbids the bodies to be left there after ſunſet. But among other nations they were ſuffered to remain upon the croſs a long time. Sometimes they were devoured alive by birds and beaſts of prey. Guards were appointed to obſerve that none of their friends or relations ſhould take them down and bury them. The ſtory of the Epheſian matron and the ſoldier who was ſet to guard the croſs, is very well known. The Roman ſoldiers who had crucified Jeſus Chriſt and the two thieves continued near the croſſes till the bodies were taken down and buried.

Croſſes were uſually, in former times, erected on the tops of houſes, by which tenants pretended to claim the privileges of the Templars Hoſpitallers, to defend themſelves againſt their rightful lords. This was condemned by the ſtatute Wil. II. c. 37. It was uſual alſo, in thoſe days, to ſet up croſſes in places where the corpſe of any of the nobility reſted as it was carried to be buried, that *à tranſeuntibus pro ejus animo deprecentur.* Croſſes, &c. are forbidden to be brought into England by 13 Eliz. c. 2. on pain of a *præmunire*, &c.

Invention of the CROSS, an ancient feaſt ſolemnized on the third of May, in memory of St Helena's (the mother of Conſtantine) finding the true croſs of Chriſt deep in the ground on Mount Calvary; where ſhe erected a church for the preſervation of part of it; the reſt being brought to Rome and depoſited in the church of the Holy Croſs of Jeruſalem.

Theodoret mentions the finding of three croſſes; that of Jeſus Chriſt and thoſe of the two thieves; and that they diſtinguiſhed between them by means of a ſick women, who was immediately healed by touching the true croſs. The place is ſaid to have been pointed out to her by St Quiriacus, then a Jew, afterwards converted and canonized.

Exaltation of the CROSS, an ancient feaſt, held on the 14th of September, in memory of this, that Heraclitus reſtored to Mount Calvary the true croſs in 642, which had been carried off 14 years before by Coſroes king of Perſia, upon his taking Jeruſalem from the emperor Phocas.

The adoration of the croſs appears to have been practiſed in the ancient church; inaſmuch as the heathens, particularly Julian, reproached the primitive Chriſtians with it. And we do not find that their apologiſts diſclaimed the charge. Mornay, indeed, aſſerted, that this had been done by St Cyril, but could not ſupport his allegation at the conference of Fountainbleau. St Helena is ſaid to have reduced the adoration of the croſs to its juſt principle, ſince ſhe adored in the wood, not the wood itſelf, which had been direct idolatry and heatheniſm, but him who had been nailed to this wood. With ſuch modifications ſome Proteſtants have been induced to admit the adoration of the croſs. John Huſs allowed of the phraſe, provided it were expreſsly added, that the adoration was relative to the perſon of Chriſt. But however Roman Catholics may ſeem to triumph by virtue of ſuch diſtinction and mitigations, it is well known they have no great place in their own practice. Imbert, the good prior of Gaſcony, was ſeverely proſecuted in 1683 for telling the people, that in the ceremony of adoring the croſs, practiſed in that church on Good Friday, they were not to adore the wood, but Chriſt, who was crucified on it. The curate of the pariſh told them the contrary: it was the wood! the wood! they were to adore. Imbert replied, it was Chriſt, not the wood: for which he was cited before the archbiſhop of Bourdeaux, ſuſpended from his functions, and threatened with chains and perpetual impriſonment. It little availed him to cite the biſhop of Meaux's diſtinction; it was anſwered that the church allowed it not.

Cross-Bearer (port-croix, crucifer), in the Romiſh church, the chaplain of an archbiſhop or a primate, who bears a croſs before him on ſolemn occaſions.

The pope has the croſs borne before him everywhere; a patriarch anywhere out of Rome; and primates, metropolitans, and thoſe who have a right to the pallium, throughout their reſpective juriſdictions.

Gregory XI. forbade all patriarchs and prelates to have it borne in preſence of cardinals. A prelate bears a ſingle croſs, a patriarch a double croſs, and the pope a triple one on his arms.

Cross-Bearers alſo denote certain officers in the inquiſition, who make a vow before the inquiſitors or their vicars to defend the Catholic faith, though with the loſs of fortune and life. Their buſineſs is to provide the inquiſitors with neceſſaries. They were formerly of great uſe; but in proceſs of time ſome of their conſtitutions were changed, and they were called of the penance of St Dominic.

Pectoral Cross, is a croſs of gold or ſilver, or other precious materials, often enriched with diamonds, which the biſhops, archbiſhops, &c. and regular abbeſſes, wear hanging from the neck.

Order of the Cross, or *Croiſade*, an order of ladies inſtituted in 1668 by the empreſs Eleonora de Gonzagua, wife of the emperor Leopold; on occaſion of the miraculous recovery of a little golden croſs wherein were incloſed two pieces of the true croſs, out of the aſhes of part of the palace. It ſeems the fire had burnt the caſe wherein it was incloſed, and melted the cryſtal, yet the wood remained untouched.

Maids of the Cross, a community of young women inſtituted in 1265 at Roye in Picardy, and ſince diſperſed to Paris and other towns. They inſtruct young perſons of their own ſex. Some take the three vows of poverty, chaſtity, and obedience; others retain their liberty. They are under the direction of a ſuperior.

Cross, in *Heraldry*, is defined by Guillim, an ordinary compoſed of fourfold lines; whereof two are perpendicular, and the other two tranſverſe; for ſo we muſt conceive of them, though they be not drawn throughout, but meet by couples, in four right angles near the feſſe point of the eſcutcheon. See Heraldry.

This bearing was firſt beſtowed on ſuch as had performed, or at leaſt undertaken, ſome ſervice for Chriſt, and the Chriſtian profeſſion; and is held by divers the moſt honourable charge in all heraldry. What brought it into ſuch frequent uſe, was the ancient expeditions into the Holy Land; and the holy war pilgrims, after their pilgrimage, taking the croſs for their cognizance; and the enſign of that war being the croſs. In thoſe wars, ſays Mackenzie, the Scots carried St Andrew's croſs; the French a croſs argent; the Engliſh a croſs or; the Germans, ſable; the Italians, azure; the Spaniards, gules.

St George's Cross, or the red croſs, in a field argent, is now the ſtandard of England; that ſaint being the reputed patron of this nation.

Nor is it only in croſſes that the variety is ſo great; the like is found in many other bearings, and particularly in lions, and the parts of them; whereof Columbiere gives us no leſs than 96 varieties. Leigh mentions but 46 ſeveral croſſes; Sylvanus Morgan, 26; Upton, 30; Johannes de Bado Aureo, 12; and ſo others, whom it is needleſs to mention. Upton owns he dares not preſume to aſcertain all the various croſſes uſed in arms, for that they are at preſent almoſt innumerable; and therefore he only takes notice of ſuch as he had ſeen uſed in his own time.

Cross, in mining, two nicks cut on the ſuperficies of the earth, thus +, which the miners make when they take the ground to dig for ore. This croſs gives the miners three days liberty to make and ſet on ſtones. As many of theſe croſſes as the miner makes, ſo many mears of ground he may have in the vein, provided he ſet on ſtones within three days after making his croſs or croſſes. But if he make but one croſs, and a ſtander by makes the ſecond, and a ſtranger makes the third, every one is ſerved with the next mear, according as they have firſt or laſt, ſooner or later, made their croſs or croſſes upon the ground.

Cross, in coins, a name given to the right ſide or face, the other being called the *pile* or *reverſe*. It has been a common error, that the reverſe was meant by the croſs; becauſe at this time, with us, it is marked with figures diſpoſed in that form: but the ſtamping the head of the prince in theſe kingdoms on the right ſide of the coin, was preceded by a general cuſtom of ſtriking on that part the figure of a croſs; while the other, called the *pile*, contained the arms, or ſome other device.

Cross, inſtead of a ſignature to a deed, &c. is derived from the Saxon practice of affixing the ſign of the croſs, whether they could write or not.

Cross, in ſurveying, is an inſtrument which conſiſts of a braſs circle, divided into four equal parts by two lines croſſing each other in the centre. At each extremity of the lines is fixed a perpendicular ſight, with ſmall holes below each ſlit, for the better diſcovering of diſtant objects. The croſs is mounted on a ſtaff or ſtand, to fix it in the ground, and it is found to be a very uſeful inſtrument for meaſuring ſmall pieces of land, and taking offsets, &c.

Cross-Bar Shot, a bullet with an iron bar paſſing through it, and ſtanding ſix or eight inches out at both ſides. It is uſed at ſea for deſtroying the enemy's rigging.

Cross-Bill. See LOXIA, ORNITHOLOGY *Index*.

Cross-Bill, in chancery, is an original bill, by which the defendant prays relief againſt the plaintiff.

Cross-Bows. See BOWS and ARCHERY.

Cross-grained Stuff, in joinery. Wood is ſaid to be croſs-grained, when a bough or branch has ſhot out of it; for the grain of the branch ſhooting forward, runs athwart that of the trunk.

In wood well grown this defect is ſcarce perceivable, except in working; but in deal-boards theſe boughs make knots. If the bough grew up with the young trunk, inſtead of a knot is found a curling in the ſtuff, very ſenſible under the plane.

Cross-Jack, pronounced *cro-jeck*, a ſail extended on the lower yard of the mizen-maſt, which is hence called the *croſs-jack yard*. This ſail, however, has generally been found of little ſervice, and is therefore very ſeldom uſed.

Cross-Piece, a rail of timber extended over the windlaſs of a merchant ſhip from the knight-heads to the belfry. It is ſtruck full of wooden pins, which are uſed to faſten the running rigging as occaſion requires. See WINDLASS.

Cross-Staff, or *Fore-ſtaff*, is a mathematical inſtrument of hard wood, conſiſting of a ſquare ſtaff of about three feet long, having each of its faces divided like a line of tangents, and having four croſs pieces of unequal lengths to fit on the ſtaff, the halves of theſe being as the radii to the tangent lines on the faces of the ſtaff.—The inſtrument was formerly uſed in taking the altitudes of the celeſtial bodies at ſea.

Cross-Tining, in *Huſbandry*, a method of harrowing land, conſiſting in drawing the harrow up the interval it went down before, and down that which it was drawn up.

Cross-Trees, certain pieces of timber, ſupported by the cheeks and treſtle-trees, at the upper ends of the lower maſts, athwart which they are laid to ſuſtain the frame of the top.

Cross-Tree Yard, is a yard ſtanding ſquare, juſt under the mizen-top, and to it the mizen-top is faſtened below. See *Cross-Jack*.

Cross-Wort. See VALANTIA, BOTANY *Index*.

Ordeal of the Cross, a ſpecies of trial frequently practiſed in the days of ſuperſtition. See ORDEAL.

CROSS, an Engliſh artiſt, famous only for copying, in the reigns of Charles I. and Charles II. Of this talent there is a ſtory current, more to the credit of his ſkill than of his probity. He is ſaid to have been employed by Charles I. to copy the celebrated Madona of Raphael in St Mark's church at Venice; and that, having obtained leave of the ſtate for that purpoſe, he executed his piece ſo well as to bring away the original and leave his copy in the place of it. The deception was not detected until it was too late to recover the loſs; and this piece was bought in Oliver Cromwell's time by the Spaniſh ambaſſador for his maſter, who placed it in the Eſcurial.

CROSSEN, a handſome town of Sileſia in Germany, and capital of a principality of the ſame name. It is ſituated at the confluence of the rivers Bobar and Oder, in a fertile country abounding in wine and fruits. There is a bridge over the Oder which is fortified. E. Long. 15. 20. N. Lat. 52. 5.

CROSSOSTYLUS, in *Botany*, a genus of plants belonging to the monadelphia claſs.

CROTALARIA, RATTLE-WORT; a genus of plants belonging to the diadelphia claſs; and in the natural method ranking under the 32d order *Papilionaceæ*.

CROTALO, an inſtrument of military muſic, like that deſcribed in the next article. The Turks were the firſt, among the moderns, who introduced the uſe of it for their troops. It is now common in Flanders and Florence, and other territories on the continent. It has only one tone; but its effect in marking time may be diſtinctly heard through the noiſe of forty drums. This is the ſame inſtrument with the ancient cymbalum.

CROTALUM, an ancient kind of caſtagnetta, or muſical inſtrument, found on medals, in the hands of the prieſts of Cybele. The crotalum differed from the ſiſtrum; though authors frequently confound the two. It conſiſted of two little braſs plates or rods, which were ſhaken in the hand, and in ſtriking againſt each other made a noiſe.

It was ſometimes alſo made of a reed ſplit lengthwiſe; one part whereof they ſtruck againſt the other; and as this made a noiſe ſomewhat like that of a crane's bill, they called that bird *crotaliſtria*, a player on the crotala: and Ariſtophanes calls a great talker a *crotalum*.

Clemens Alexandrinus attributes the invention to the Sicilians; and forbids the uſe thereof to the Chriſtians, becauſe of the indecent motions and geſtures that accompany it.

CROTALUS, or RATTLE-SNAKE, in *Zoology*, a genus belonging to the order of amphibia ſerpentes. See OPHIOLOGY *Index*. The following is the account given by Mr Cateſby of the *crotalus horridus*, or American rattle-ſnake. This grows ſometimes to the length of eight feet, and weighs between eight and nine pounds. The colour of the head is brown; the eye red; the upper part of the body of a yellowiſh-brown colour, tranſverſely marked with irregular broad black liſts. The rattle is of a brown colour, compoſed of ſeveral horny, membranous cells, of an undulated pyramidal figure. Theſe are articulated within one another in ſuch a manner that the point of the firſt cell reaches as far as the baſis of the protuberant ring of the third, and ſo on; which articulation, being very looſe, gives liberty to the parts of the cells that are incloſed within the outward rings to ſtrike againſt the ſides of them, and ſo to cauſe the rattling noiſe which is heard when the ſnake ſhakes its tail. This is the moſt inactive and ſlow-moving of all the ſnakes, and is never the aggreſſor except in what it preys upon. The above gentleman is of opinion that no remedy is yet diſcovered for the bite of this animal. He had frequently acceſs to ſee Indians bitten by it, and always thought that thoſe who recovered were cured more through the force of nature, or by reaſon of the ſlightneſs of the bite, than by the remedies uſed. He tells us, that the Indians know their deſtiny the moment they are bitten; and if the bite happens to be on any of the large veins, they apply no remedies, as knowing them to be entirely uſeleſs. He believes the reports of the faſcinating power of this ſerpent, though he never had an opportunity of ſeeing it. See the articles Poison and Serpent.

CROTALYSTRIÆ, in antiquity, a kind of morice dancers, admitted to entertainments, in order to divert the company with their dancing and playing on an inſtrument called *crotalum*, whence they had their name.

CROTCHET, in *Muſic*, one of the notes or characters of time, equal to half a minim, and double of a quaver.

Crotchets are alſo marks or characters, ſerving to incloſe a word or ſentence which is diſtinguiſhed from the reſt, being generally in this form [ ].

CROTO, or Croton, in *Ancient Geography*, a noble city of the Bruttii, built by the Acheans, 150 ſtadia to the north of Lacinium, and in the neighbourhood of Metapontum. It was twelve miles in compaſs before the arrival of Pyrrhus in Italy; but after the deſolation produced by that war, ſcarce half of it was inhabited. The citadel on one ſide hung over the ſea, on the other towards the land. It was naturally ſtrong from its ſituation, but afterwards walled round; on which ſide it was taken by Dionyſius by ſtratagem, by means of the rocks behind it.

Pythagoras, after his long peregrinations in ſearch of knowledge, fixed his reſidence in this place, which ſome authors think his native one, at leaſt that of his parents, ſuppoſing him to have been born in the iſle of Samos, and not at ſome town of that name in Italy. This incomparable ſage ſpent the latter part of his life in training up diſciples to the rigid exerciſe of ſublime and moral virtue, and inſtructing the Crotonites in the true arts of government, ſuch as alone can inſure happineſs, glory, and independence.

Under the influence of this philoſophy, the Crotonites inured their bodies to frugality and hardſhips, and their minds to ſelf-denial and patriotic diſintereſtedneſs. Their virtues were the admiration of Greece, where it was a current proverb, that the laſt of the Crotonites was the firſt of the Greeks. In one Olympiad, ſeven of the victors in the games were citizens of Croton; and the name of Milo is almoſt as famous as that of Hercules. The vigour of the men and beauty of the women were aſcribed to the climate, which was believed to be endowed with qualities peculiarly favourable to the human ſyſtem. Their phyſicians were in high repute; and among thoſe, Alcmeon and Democides rendered themſelves moſt conſpicuous. Alcmeon was the firſt who dared to amputate a limb, in order to ſave the life of a patient; and alſo the firſt writer who thought of inculcating moral precepts under the amuſing cloak of apologues. This invention is more commonly attributed to Æſop, as he was remarkably ingenious in this ſpecies of compoſition. Democides was famous for his attachment to his native ſoil. Though careſſed and enriched by the king of Perſia, whoſe queen he had ſnatched from the jaws of death, he abandoned wealth and honours, and by ſtratagem eſcaped to the humble comforts of a private life at Croton.—The Pythagoreans are ſaid to have diſcovered that diſpoſition of the ſolar ſyſtem, which, with ſome modifications, has been revived by Copernicus, and is now univerſally received, as being moſt agreeable to nature and experiment. Theano, the wife of Pythagoras, and many other women, emulated the virtues of their huſbands.

In thoſe fortunate days the ſtate of Croton was moſt flouriſhing. Its walls incloſed a circumference of 12 miles. Of all the colonies ſent out from Greece, this alone furniſhed ſuccour to the mother-country when invaded by the Perſians. By its avenging arms the Sybarites were puniſhed for their ſhameful degeneracy; but victory proved fatal to the conquerors, for riches, and all their pernicious attendants, inſinuated themſelves into Croton, and ſoon contaminated the purity of its principles. Indeed, the very conſtitution of human nature militates againſt any long continuance in ſuch rigid practices of virtue; and therefore it is no wonder if the Crotonites fell by degrees into the irregularities they once abhorred. Not long after the Locrians, who were leſs corrupted, defeated them on the banks of the Sagra, and reduced the republic to diſtreſs and penury. This reſtored the remaining Crotonites to their priſtine vigour of mind, and enabled them to make a brave, though unſucceſsful reſiſtance, when attacked by Dionyſius of Syracuſe. They ſuffered much in the war with Pyrrhus, and, by repeated misfortunes, decreaſed in ſtrength and numbers, from age to age, down to that of Hannibal, when they could not muſter 20,000 inhabitants. This ſmall population being incapable of manning the extenſive works erected in the days of proſperity, Croton was taken by the Carthaginians, and its citizens tranſported to Locri. The Romans ſent a colony hither 200 years before Chriſt. In the Gothic war, this city rendered itſelf conſpicuous by its fidelity to Juſtinian, and Totila beſieged it long in vain.

CROTON, wild ricinus; a genus of plants, belonging to the monœcia claſs; and in the natural method ranking under the 38th order, *Tricoccæ*. See Botany *Index*.

CROTONA, a town of Italy, in the kingdom of Naples, ſeated on the gulf of Taranto, with a biſhop's ſee and citadel. E. Long. 17. 27. N. Lat. 39. 10.

CROTOPHAGA, a genus of birds belonging to the order of picæ. See Ornithology *Index*.

CROTOY, a town of France, in Picardy, and in Ponthieu. The fortifications are demoliſhed. It is ſeated at the mouth of the river Somme. E. Long. 1. 45. N. Lat. 50. 15.

CROUCHED friars. See Croisiers.

CROUP, in *Medicine*. See Medicine *Index*.

Croup of a Horſe, in the manege, the extremity of the reins above the hips.

CROUPADE, in the manege, a leap, in which the horſe pulls up his hind legs, as if he drew them up to his belly.

CROUTE, Sour Croute, or Kroute. As this preparation of cabbage has been found of ſovereign efficacy as a preſervative in long voyages from the ſea-ſcurvy, it may not be unacceptable to give a conciſe account of the proceſs for making it, according to the information communicated by an ingenious German gentleman.

The ſoundeſt and moſt ſolid cabbages are ſelected for this uſe, and cut very ſmall, commonly with an inſtrument made for this purpoſe, not unlike the plain which is uſed in this country for ſlicing cucumbers. A knife is uſed when the preparation is made with great nicety. The cabbage thus minched is put into a barrel in layers, hand high, and over each is ſtrewed a handful of ſalt and carraway ſeeds; in this manner it is rammed down with a rammer, *ſtratum ſuper ſtratum*, till the barrel be full; when a cover is put over it and preſſed down with a heavy weight. After ſtanding ſome time in this ſtate it begins to ferment; and it is not till the fermentation has entirely ſubſided that the head is fitted to it, and the barrel is finally ſhut up and preſerved for uſe. There is not a drop of a vinegar employed in this preparation. The Germans write this preparation in the following manner: *Sauer kraut*, or *ſauer kohl;* that is, in their language, "ſour herb, or ſour cabbage."

CROUSAZ, John Peter de, a learned philoſopher and mathematician, was born in 1663. Having made great progreſs in the mathematics and the philoſophy of Des Cartes, he travelled to Geneva, Holland, and France; was ſucceſſively profeſſor in ſeveral univerſities; and at length was choſen governor to Prince Frederick of Heſſe Caſſel, nephew to the king of Sweden. He wrote many works; the moſt eſteemed of which are, 1. His Logic, the beſt edition of which is that of 1741, in 6 vols 8vo. 2. A Treatiſe on Beauty. 3. A Treatiſe on the Education of Children, 2 vols 12mo. 4. Several Treatiſes on Philoſophical and Mathematical Subjects, &c. He died at Lauſanne in 1748.

CROW. See Corvus, Ornithology *Index*.

Crow, in *Mechanics*, a kind of iron lever, with a claw at one end and a ſharp point at the other; uſed for heaving or purchaſing great weights.

Crow's Bill, among ſurgeons, a kind of forceps for drawing bullets and other foreign bodies out of wounds.

Crow's Feet, in the military art, machines of iron, having four points, each about three or four inches long, ſo made that, whatever way they fall, there is ſtill a point up; they are thrown upon breaches, or in paſſes where the enemy's cavalry are to march, proving very troubleſome, by running into the horſes feet, and laming them.

Crow's Foot, on ſhipboard, a complication of ſmall cords ſpreading out from a long block, like the ſmaller parts which extend from the backbone of a herring. It is uſed to ſuſpend the *ownings;* or to keep the topſails from ſtriking violently, and fretting againſt the tops.

Crow-Net, is an invention for catching wild-fowl in the winter ſeaſon, and may be uſed in the day time. The net is made of double thread, or fine packthread; the meſhes ſhould be two inches wide, the length about ten yards, and the depth three; it muſt be verged on the ſide with good ſtrong cord, and ſtretched out very ſtiff on long poles prepared for that purpoſe. When you are come to the place where you would ſpread your net, open it, and lay it out at its full length, and breadth; then faſten the lower end of the net all along the ground, ſo as only to move it up and down; the upper end of the net muſt ſtand extended on the long cord; the further end thereof being ſtaked firſt to the earth by a ſtrong cord about five yards diſtant from the net. Place this cord in an even line with the lower edge of the net. The other end muſt be at leaſt 25 yards diſtant to reach into ſome natural or artificial ſhelter, by the means of which you may lie concealed from the fowl, otherwiſe no good ſucceſs can be expected. The net muſt be placed in ſuch exact order that it might give way to play on the fowl on the leaſt pull of the cord, which muſt be done ſmartly, leſt the fowl ſhould prove too quick for you. This net may be uſed for pigeons, crows, or other birds, on corn-fields newly ſown; as alſo in ſtubble-fields, provided the ſtubble conceals the net from the birds.

CROWD, in a general ſenſe, ſignifies a number of people aſſembled in a place ſcarce big enough to hold them all.

To Crowd, in the ſea-language, is to carry an extraordinary force of ſail upon a ſhip, in order to accelerate her courſe on ſome important occaſion; as in purſuit of, or flight from an enemy; to eſcape any immediate danger, &c.

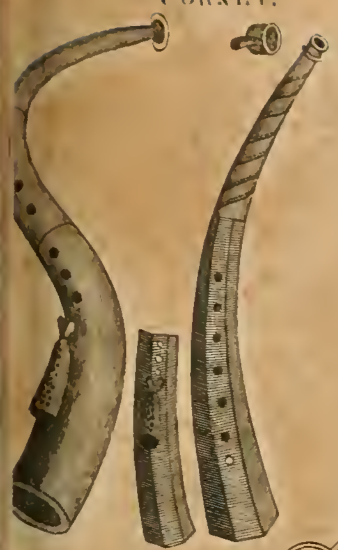
CROWLAND, a town in Lincolnſhire, ſeated in the fens, in a dirty ſoil, and had formerly an abbey of very great note. There is no coming at it but by narrow cauſeways, which will not admit a cart. It has three ſtreets, ſeparated from each other by water-courſes, whoſe banks are ſupported by piles, and ſet with willow trees. Their chief trade is in fiſh and fowl, which are in great plenty in the adjacent pools and marſhes. W. Long. 0. 10. N. Lat. 52. 40.

CROWN, an ornament worn on the head by kings, ſovereign princes, and noblemen, as a mark of their dignity.

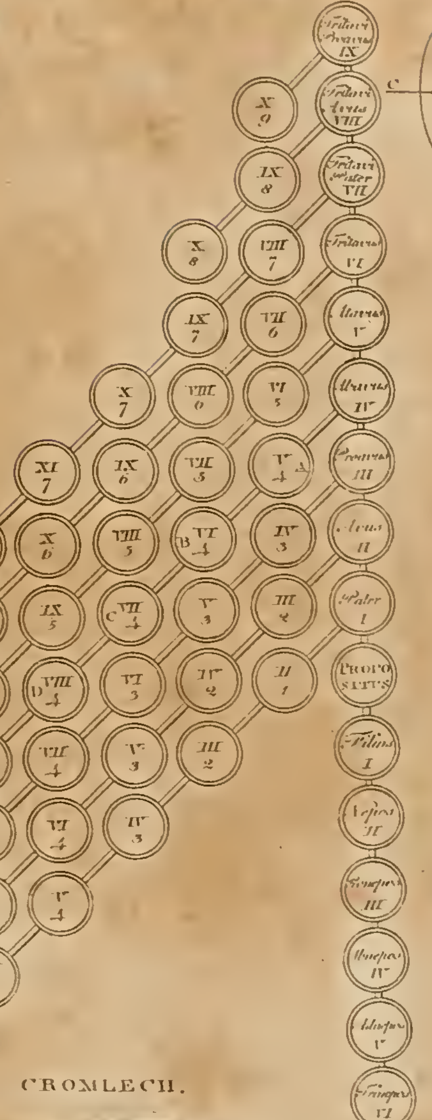
In ſcripture there is frequent mention of crowns, and the uſe of them ſeems to have been very common among the Hebrews. The high prieſt wore a crown, which was a fillet of gold placed upon the forehead, and tied with a ribbon of hyacinth colour, or azure blue. It ſeems alſo as if private prieſts, and even common Iſraelites, wore alſo a ſort of crown, ſince God commands Ezekiel not to take off his crown, nor aſſume the marks of one in mourning. This crown was no more than a ribbon or fillet, with which the Jews and ſeveral people in the eaſt girt their heads. And indeed the firſt crowns were no more than a bandelet drawn round the head, and tied behind, as we ſtill ſee it repreſented on medals round the heads of Jupiter, the Ptolemies, and kings of Syria. Afterwards they conſiſted of two bandelets; by degrees they took branches of trees of divers kinds; at length they added flowers, inſomuch that Claudius Saturninus ſays, there was not any plant whereof crowns had not been made. The woods and groves were ſearched to find different crowns for the ſeveral deities; and they were uſed not only on the ſtatues and images of the gods, by the prieſts in ſacrificing, and by kings and emperors, but alſo on altars, temples, doors of houſes, ſacred victims, ſhips, &c.

The Roman emperors had four kinds of crowns, ſtill ſeen on medals, viz. a crown of laurels, a radial or radiating crown, a crown adorned with pearls and preci-

CORNET.



CONSANGUINITY.



CORONA or HALO.

Fig. 1.

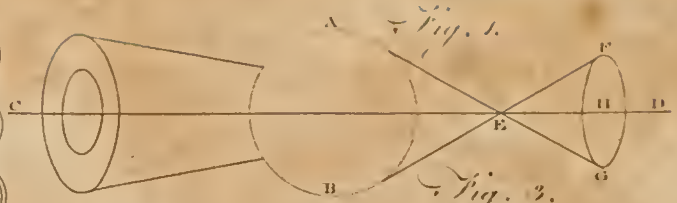


Fig. 2.

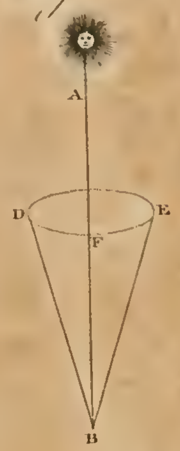


Fig. 3.

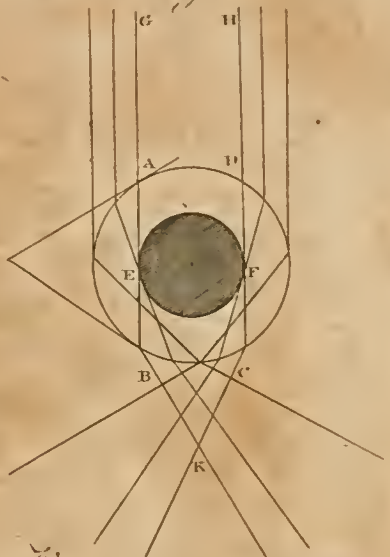
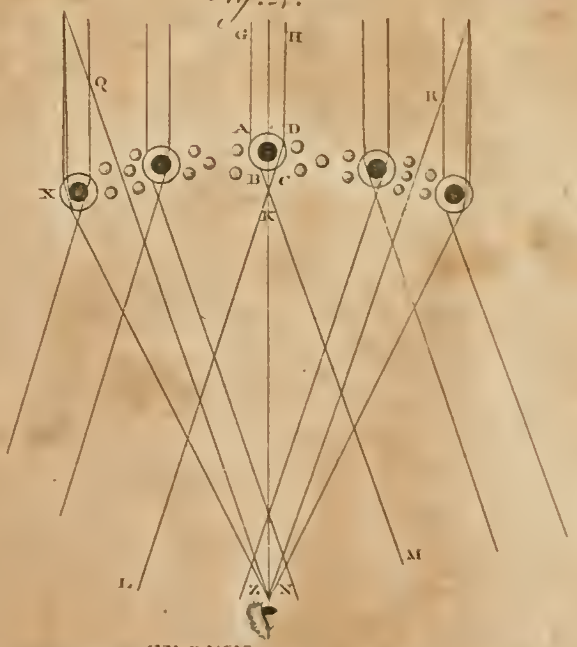
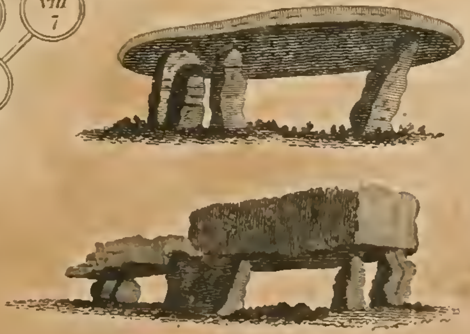


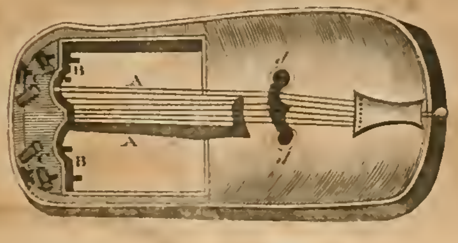
Fig. 4.



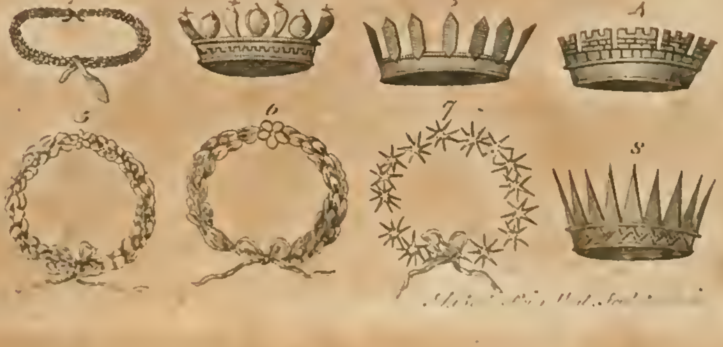
CROMLECH.



CROWTH.



CROWN.



[illegible]

ous ſtones, and the fourth a kind of bonnet or cap, ſomething like the mortier.

The Romans had alſo various kinds of crowns, which they diſtributed as rewards of military atchievements; as, 1. The oval crown, made of myrtle, and beſtowed upon generals who were entitled to the honours of the leſſer triumph, called *ovation*. 2. The naval or roſtral crown, compoſed of a circle of gold, with ornaments repreſenting beaks of ſhips, and given to the captain who firſt grappled, or the ſoldier who firſt boarded, an enemy's ſhip. 3. The crown called in Latin *vallaris*, or *caſtrenſis*, a circle of gold raiſed with jewels or paliſades; the reward of him who firſt forced the enemy's entrenchments. 4. The mural crown, a circle of gold indented and embattled; given to him who firſt mounted the wall of a beſieged place, and there lodged a ſtandard. 5. The civic crown, made of the branch of a green oak, and given him who had ſaved the life of a citizen. 6. The triumphal crown, conſiſting at firſt of wreaths of laurel, but afterwards made of gold; proper to ſuch generals as had the honour of a triumph. 7. The crown called *obſidionalis*, or *graminea*, made of graſs growing on the place; the reward of a general who had delivered a Roman army from a ſiege. 8. The radial crown, given to princes at their tranſlation among the gods. We meet alſo with the corona aurea, often beſtowed on ſoldiers without any other additional term; athletic crowns, and crowns of laurel, deſtined to crown victors at the public games, poets, orators, &c. All theſe crowns were marks of nobility to the wearers; and upon competitions with rivals for rank and dignities, often determined the preference in their favour. See Plate CLXIV. For an account of modern crowns ſee HERALDRY.

CROWN is alſo uſed to ſignify the poſſeſſions and dignity of a king. The crown of England, according to Sir William Blackſtone, is by common law and conſtitutional cuſtom, hereditary; and this in a manner peculiar to itſelf; but the right of inheritance may from time to time be changed or limited by act of parliament, under which limitations the crown ſtill continues hereditary. See SUCCESSION.

Pleas of the CROWN. See PLEAS.

CROWN, in *Commerce*, is a general name for coins, both foreign and domeſtic, of or near the value of five ſhillings ſterling. In its limited ſenſe, crown is only applicable to that popular Engliſh coin which bears the name and which is equivalent to ſixty Engliſh pence or five ſhillings, or to ſix livres French money. But, in its extenſive ſenſe, it takes in ſeveral others; as the French ecu, which we call the French crown, ſtruck in 1641 for ſixty ſols, or three livres; alſo the petagon, dollar, ducatoon, rixdollar, and piaſtre or piece of eight.

CROWN, in an eccleſiaſtical ſenſe, is uſed for the clerical tonſure; which is the mark or character of the Romiſh eccleſiaſtics. This is a little circle of hair ſhaved off from the crown of the head; more or leſs broad, according to the quality of the orders received: That of a mere clerk is the ſmalleſt; that of prieſts and monks the largeſt. The clerical crown was anciently a round liſt of hair, ſhaved off around the head, repreſenting a real crown: this is eaſily obſervable in ſeveral ancient ſtatues, &c. The religious of St Dominic and St Francis ſtill retain it.

CROWN, among jewellers, the upper work of the roſe diamond, which all centres in the point at the top, and is bounded by the horizontal ribs.

CROWN-Office, an office belonging to the king's bench court, of which the king's coroner or attorney is commonly maſter. In this office, the attorney general and clerk of the crown ſeverally exhibit informations for crimes and miſdemeanours at common law, as in the caſe of batteries, conſpiracies, libelling, &c. on which the offender is liable to pay a fine to the king.

CROWN-Glaſs, denotes the fineſt ſort of window-glaſs. See GLASS.

CROWN-Scabs. See FARRIERY *Index*.

CROWN-Wheel of a Watch, the upper wheel next the balance, which by its motion drives the balance, and in royal pendulums is called the *ſwing-wheel*.

CROWN Imperial. See FRITILLARIA, BOTANY *Index*.

CROWN-Work, in *Fortification*, is an out-work running into the field; deſigned to keep off the enemy, gain ſome hill or advantageous poſt, and cover the other works of the place. The crown-work conſiſts of two demi-baſtions at the extremes, and an entire baſtion in the middle, with curtains.

CROWN, in *Aſtronomy*, a name given to two conſtellations, the ſouthern and the northern.

CROWN, in *Geometry*, a plane ring included between two parallel or concentric peripheries of unequal circles.

CROWN-Poſt, is a poſt in ſome building ſtanding upright in the middle between two principal rafters; and from which proceed ſtruts or braces to the middle of each rafter. It is otherwiſe called a *king poſt*, or *king's piece*, or *joggle-piece*.

CROWNE, JOHN, a celebrated dramatic writer, born in Nova Scotia, where his father was a miniſter. Being impatient of the gloomy reſtraint of that country, he came to England, where he was reduced to enter into the ſervice of an old lady; of which he was ſoon as weary as he had been of America. He then had recourſe to his pen, which quickly procured him favour at court: but this kind of ſubſiſtence proving precarious, he ventured to ſolicit Charles II. for ſome eſtabliſhment. Charles promiſed to provide for him, but inſiſted firſt on having another comedy; and ſuggeſted to him the plan of a Spaniſh play, from which Crowne produced the comedy of *Sir Courtly Nice*: but the ſudden death of the king on the laſt day of the rehearſal, plunged him at once from his pleaſing expectations into diſappointment and diſtreſs, and left him no reſource but his wits. He died ſome time about the year 1703; and left behind him 17 tragedies and comedies, ſome of which are acted with great ſucceſs. His chief excellence lay in comedy; yet his tragedies are far from being contemptible. His plots are for the moſt part his own invention; his characters are in general ſtrongly coloured and highly finiſhed; and his dialogue lively and ſpirited, attentively diverſified, and well adapted to the ſeveral ſpeakers. So that on the whole he may aſſuredly be allowed to ſtand at leaſt in the third rank of our dramatic writers.

CROWNING, in *Architecture*, is underſtood, in the general, of any thing that terminates or finiſhes a member or decoration. Thus, a corniche, a pediment, &c. are called *crownings*. Thus alſo the abacus is ſaid to crown the capital; and thus any member or moulding is ſaid to be crowned when it has a fillet over it; and a niche is crowned when it is covered with a capital.

CROWNING, in ſea-language, denotes the finiſhing part of a knot made at the end of a rope. It is performed by interweaving the ends of the different ſtrands artfully amongſt each other, ſo as that they may not become looſened or untwiſted. They are uſeful in all kinds of ſtoppers.

CROWTH, or CRUTH. See CRUTH.

CROXAL, SAMUEL, an ingenious Engliſh divine, who in his youth wrote the celebrated poem entitled *The Fair Circaſſian.* He had the livings of Hampton in Middleſex, and the united pariſhes of St Mary Somerſet, and St Mary Mounthaw, in London; both which he held till his death in 1751. He publiſhed many other poems and tranſlations, with an entire Engliſh edition of Æſop's Fables. In conſequence of his attachment to Whig principles, he enjoyed ſome other preferments, and was chaplain in ordinary to George II.

CROYDON, a town in Surry in England. Its ſituation is low, near the ſpring-head of the river Wandel, and it is in a manner ſurrounded with hills. It is pretty large, and is chiefly noted for being the ſeat of the archbiſhop of Canterbury. It has a large handſome church, an hoſpital, and a free ſchool. W. Long. 0. 5. N. Lat. 51. 22.

CRUCIAL INCISION, in *Surgery*, an inciſion made in the form of a croſs.

CRUCIANELLA, PETTY MADDER; a genus of plants, belonging to the tetrandria claſs, and in the natural method ranking under the 47th order, *Stellatæ*. See BOTANY *Index*.

CRUCIBLE, a chemical veſſel made of earth, and ſo tempered and baked as to endure the greateſt fire. They are uſed to melt metals, and to flux minerals, ores, &c.

CRUCIFIX, a croſs upon which the body of Chriſt is faſtened in effigy, uſed by the Roman Catholics to excite in their minds a ſtrong idea of our Saviour's paſſion.

They eſteem it an eſſential circumſtance of their religious worſhip performed at the altar; and on Good Friday they perform the ceremony of adoring it, which is done in theſe words, *O crux ave, ſpes unica;* "Hail, thou croſs, our only hope." The officiating prieſt uncovers the crucifix, elevates it with both his hands, and ſays, *Ecce lignum crucis;* "Behold the wood of the croſs." The people anſwer, *in quo ſalus mundi pependit;* "on which the Saviour of the world ſuffered death." Then the whole congregation bow with great reverence, and devoutly kiſs the holy wood.

CRUCIFIXION, a capital puniſhment by nailing the criminal to a croſs. See CROSS.

CRUCIFORM, in general, ſomething diſpoſed croſs-ways; but more eſpecially uſed by botaniſts, for flowers conſiſting of four petals diſpoſed in the form of a croſs.

CRUCITA, in *Botany*, a genus of the digynia order, belonging to the tetrandria claſs of plants; and in the natural method ranking with thoſe the order of which is doubtful. The interior calyx is tetraphyllous, the exterior calyx triphyllous; there is no corolla, and only one ſeed.

CRUDE, an epithet given to ſomething that has not paſſed the fire or had a proper degree of coction.

CRUDITY, among phyſicians, is applied to undigeſted ſubſtances in the ſtomach; to humours in the body which are unconcocted, and not prepared for expulſion; and to the excrements.

CRUISE, from the German *kruiſs*, "acroſs," ſignifies to croſs to and fro, to ſail up and down within a certain ſpace of the ſea, called the *cruiſing* latitude, in queſt of veſſels or fleets of an enemy, &c.

CRUISERS, in the navy, are ſmall men of war made uſe of to and fro in the Channel, and elſewhere, to ſecure our merchant ſhips and veſſels from the enemy's ſmall frigates and privateers. They are generally ſuch as ſail well, and are commonly well manned: and indeed the ſafety of the trade in the Channel, and up and down the ſoundings, and other places, abſolutely requires the conſtant keeping out ſuch ſhips at ſea.

CRUMENTATA, among zoologiſts, animals furniſhed with a pouch or bag, wherein to receive their young in time of danger; as the oppoſſum. See DIDELPHIS.

CRUOR, ſometimes ſignifies the blood in general; ſometimes only the venous blood; and ſometimes extravaſated or coagulated blood: but is moſt frequently uſed for the red globules of the blood; in contradiſtinction to the limpid or ſerous part.

CRUPPER, in the manege, the buttocks of a horſe; the rump: alſo a thong of leather put under a horſe's tail, and drawn up by thongs to the buckle behind the ſaddle, ſo as to keep him from caſting the ſaddle forwards on his neck.

CRURÆUS, CRUREUS, *Muſculus*, in *Anatomy*, a fleſhy maſs, covering almoſt all the foreſide of the os femoris, between the two vaſti, which likewiſe cover the edges of this muſcle on each ſide. See ANATOMY, *Table of the Muſcles*.

CRURAL, in *Anatomy*, an epithet given to the artery which conveys the blood to the crura or legs, and to the vein by which this blood returns towards the heart. See ANATOMY *Index*.

CRUS, in *Anatomy*, all that part of the body contained between the buttocks and the toes.

CRUSADE. See CROISADE.

CRUSADO, in commerce, a Portugueſe coin, ſtruck under Alphonſus V. about the year 1457, at the time when Pope Calixtus ſent thither the bull for a croiſade againſt the infidels. This coin has a croſs on one ſide and the arms of Portugal on the other.

CRUSCA, an Italian term ſignifying *bran*, is in uſe amongſt us to denote that celebrated academy called *Della Cruſca*, eſtabliſhed at Florence for purifying and perfecting the Tuſcan language. See ACADEMY, N° 11. The academy took its name from its office, and the end propoſed by it; which is, to refine the language, and as it were to ſeparate the bran from it. Accordingly, its device is a ſieve; and its motto, *Il piu biel fior ne coglie;* that is, "It gathers the fineſt flour thereof." In the hall or apartment where the academy meets, M. Moneonis informs us, that every thing bears an alluſion to the name and device; the ſeats are in form of a baker's baſket; their backs like a ſhovel for moving of corn; the cuſhions of gray ſatin, in form of ſacks or wallets; and the branches where the lights are placed reſembling ſacks. The vocabulary *Della Cruſca* is an excellent Italian dictionary, compoſed by this academy.

CRUSTA LACTEA, in *Medicine*, the ſame with ACHOR.

CRUSTACEOUS FISH, in *Natural Hiſtory*, are thoſe covered with ſhells, conſiſting of ſeveral pieces or ſcales; as thoſe of crabs, lobſters, &c.

Theſe are uſually ſofter than the ſhells of the teſtaceous kind, which conſiſt of a ſingle piece, and generally much thicker and ſtronger than the former; ſuch as thoſe of the oyſter, ſcallop, cockle, &c.

Dr Woodward obſerves, in his Natural Hiſtory, that of all the ſhells found in beds of all the different matters dug out of the earth, there are ſcarce any of the cruſtaceous kind: the reaſon he gives for it is, that theſe being much lighter than the reſt, muſt have floated on the ſurface at the time of the deluge, when all the ſtrata were formed; and there have corrupted and periſhed.

CRUTH, or CROWTH, a kind of muſical inſtrument formerly in uſe among the common people in Wales. It is of the fidicinal kind, ſomewhat reſembling a violin, 12 inches in length, and an inch and a half in thickneſs. It has ſix ſtrings ſupported by a bridge, and is played on with a bow: the bridge differs from that of a violin, in that it is flat and not convex on the top; a circumſtance from which it is to be inferred, that the ſtrings are to be ſtruck at the ſame time, ſo as to afford a ſucceſſion of concords. The bridge is not placed at right angles with the ſides of the inſtrument, but in an oblique direction; and, which is further to be remarked, one of the feet of the bridge goes through one of the ſound-holes, which are circular, and reſts on the inſide of the back; the other foot, which is proportionably ſhorter, reſting on the belly before the other ſound-hole. Of the ſtrings the four firſt are conducted from the bridge down the finger board, as in a common violin; but the fifth and ſixth, which are about an inch longer than the others, leave the ſmall end of the neck about an inch to the right. The whole ſix are wound up either by wooden pegs in the form of the letter T, or by iron pins, which are turned with a wreſt like thoſe of a harp or ſpinet. Of the tuning, it is to be remarked, that the fifth and ſixth ſtrings are the uniſon and octave of G; the fourth and fifth, the ſame of C; and the ſecond and firſt, the ſame of D; ſo that the ſecond pair of ſtrings are a fourth, and the third a fifth, to the firſt. See Plate CLXIV.

Concerning the antiquity of this inſtrument, there is but little written evidence to carry it further back than the time of Leland; nevertheleſs the opinion of its high antiquity is ſo ſtrong among the inhabitants of the country where it was uſed, as to afford a probable ground of conjecture, that the cruth might be the prototype of the whole fidicinal ſpecies of muſical inſtruments. Another evidence of its antiquity, but which tends alſo to prove that it was not peculiar to Wales, ariſes from a diſcovery lately made and communicated to the ſociety of antiquarians, reſpecting the abbey-church of Melroſe in Scotland, ſuppoſed to have been built about the time of Edward II. It ſeems that among the outſide ornaments of that church there is the repreſentation of a cruth, very little different from the deſcription above given. The inſtrument is now diſuſed, inſomuch that Sir John Hawkins, from whom we extract, tells us, that there is but one perſon in the whole principality of North Wales that can play upon it; and as he was at that time near 60 years of age, the ſucceſſion of performers is probably near an end.

CRUX, or St CROIX, one of the Caribbee iſlands, ſituated about 60 miles ſouth-eaſt of Porto Rico, and ſubject to Denmark. From being a perfect deſert, it has begun to flouriſh exceedingly, being made a free port, and receiving great encouragement from government. W. Long. 64. 0. N. Lat. 17. 30.

LA CRUZ, an excellent harbour on the north-weſt coaſt of America, which was diſcovered by the Spaniards in 1779. They were introduced into it by a paſſage which they called *Bucarelli's entrance*, and which they placed in 55. 18. N. Lat. and 139. 15. W. Long. from the meridian of Paris. The latitude of this paſſage as laid down by the Spaniards ſeems to be correct; but the editor of Perouſe's voyage concludes, from the ſurvey made by Captain Cook on the coaſts adjacent to the entrance of Bucarelli, that this entrance is about 135° 20′ to the weſt of Paris, or near 133° weſt of Greenwich.

The Spaniards were not long in the harbour of La Cruz before they received a viſit from the inhabitants in its neighbourhood. Bartering took place. The Indians gave their peltry, and various trifles, for glaſs beads, bits of old iron, &c. By this traffic the Spaniards were enabled to gain a ſufficiently exact knowledge of their genius, of their offenſive and defenſive arms, of their manufactures, &c. Their colour is a clear olive; many among them have, however, a perfectly white ſkin: their countenance is well proportioned in all its parts. They are robuſt, courageous, arrogant, and warlike. They clothe themſelves in one or two undreſſed ſkins (with the fur apparently); theſe are the ſkins of otters, of ſea-wolves, of benades (a ſpecies of deer), of bears, or other animals. Theſe dreſſes cover them from the neck to the middle of the leg; ſome, however, among them wear boots of ſmooth ſkin, reſembling Engliſh boots, only that thoſe of the Indians open before, and are laced tight with a ſtring. They wear hats woven from the fine bark of trees, which is formed into the ſhape of a funnel or a cone. At the wriſts they have bracelets of copper or iron, or for want of theſe metals the fins of whales; and round the neck, necklaces of ſmall fragments of bones of fiſhes and other animals, and even copper collars of the bigneſs of two fingers. They wear in their ears pendants of mother-of-pearl, or flat pieces of copper, on which is emboſſed a reſin of a topaz colour, and which are accompanied with jet beads. Their hair is long and thick, and they make uſe of a comb to hold it together in a ſmall queue from the middle to the extremity; a narrow ribbon of coarſe linen, woven for this purpoſe, ſerves as a ligament. They wear alſo as a covering a kind of ſcarf, woven in a particular manner, ſomething more than a yard and a half long, and about half a yard broad, round which hangs a fringe ſomething more than half a quarter of a yard deep, of which the thread is regularly twiſted.

The women give proofs of their modeſty and decency by their dreſs. Their phyſiognomy is agreeable, their colour freſh, their cheeks vermilioned, and their hair long: they plait it together in one long treſs. They wear a long robe of a ſmooth ſkin tied round the loins, like that of a nun; it covers them from the neck as low as the feet; the ſleeves reach down to the wriſts. Upon this robe they put divers ſkins of otters or other animals to defend themſelves from the inclemency of the weather. All the married women have a large opening in the under lip, and this opening or orifice is filled up by a piece of wood cut in an oval ſhape, of which the ſmalleſt diameter is almoſt an inch; the more a woman is advanced in years the more this curious ornament is extended; it renders them frightful, the old women eſpecially, whoſe lip, deprived of its wonted ſpring, and dragged by the weight of this extraordinary jewel, neceſſarily hangs in a very diſagreeable manner. The girls wear only a copper needle, which croſſes the lip in the place where the ornament is intended hereafter to be placed.

Theſe Indians in war make uſe of cuiraſſes and ſhoulder-pieces of a manufacture like that of the whalebone ſtays among the Europeans. Narrow boards or ſcantlings form, in ſome ſort, the woof of the texture, and threads are the warp: in this manner the whole is very flexible, and leaves a free uſe to the arms for the handling of weapons. They wear round the neck a coarſe and large gorget which covers them as high as below the eyes, and their head is defended by a morion, or ſkull-piece, uſually made of the head of ſome ferocious animal. From the waiſt downwards, they wear a kind of apron, of the ſame contexture as their cuiraſs. Laſtly, a fine ſkin hangs from their ſhoulders down to the knee. With this armour, they are invulnerable to the arrows of their enemies; but thus armed, they cannot change poſition with ſo much agility as if they were leſs burdened.

Their offenſive arms are arrows; bows, of which the ſtrings are woven like the large cords of our beſt muſical inſtruments; lances, four yards in length, tongued with iron; knives, of the ſame metal, longer than European bayonets, a weapon however not very common among them; little axes of flint, or of a green ſtone, ſo hard that they cleave the moſt compact wood without injury to their edge.

The pronunciation of their language is extremely difficult; they ſpeak from the throat, with a movement of the tongue againſt the palate. The little uſe the women make of their inferior lip greatly injures the diſtinctiveneſs of their language. The Spaniards could neither pronounce nor write the words which they heard.

From the vivacity of ſpirit in theſe Indians, and from their attention amply to furniſh the market eſtabliſhed in the harbour, it may be concluded that they are pretty laborious. They continually brought ſtuffs well woven and ſhaded with various colours, the ſkins of land and ſea wolves, of otters, bears, and other ſmaller animals; of theſe ſome were raw, and others dreſſed. There were to be found at this market alſo coverlets of coarſe cloth, ſhaded with white and brown colours, very well woven, but in ſmall quantities: large ribbons of the ſame linen which might match with that of the Spaniſh officers mattreſſes; ſkeins of thread ſuch as this cloth was made of; wooden plates or bowls neatly worked; ſmall boats, or canoes, painted in various colours, the figures of which repreſented heads with all their parts; frogs in wood, nicely imitated, which opened like tobacco boxes, and which they employed to keep their trinkets in; boxes made of ſmall planks, of a cubical form, being three quarters of a yard on each ſide, with figures well drawn or carved on the outſide, repreſenting various animals; the covers fabricated like Flanders etwees, with rabbeted edges, formed ſo as to ſhut into the body of the box; animals in wood, as well thoſe of the earth as of the air; figures of men of the ſame material, with ſkull-caps repreſenting the heads of various fierce animals; ſnares and nets for fiſhing; copper collars for the neck, and bracelets of iron for the wriſt, but which they would not part with except at a very high price; beak-like inſtruments, from which they drew ſounds as from a German flute. The principal officers took ſuch of theſe merchandiſes as were moſt agreeable to them, and left the remainder to the ſhips crews.

As the Indians diſcovered that the Spaniards were very dainty in their fiſh, they did not let them want for choice: the greateſt abundance was in ſalmon, and a ſpecies of ſole or turbot three yards and a quarter long, broad and thick in proportion; cod and pilchards were alſo brought to market, and fiſhes reſembling trout. From all this it may be inferred, that this gulf is full of fiſh; the banks too are covered with ſhells.

The quantity of mother-of-pearl that theſe Indians cut to pieces for making ear-rings awakened the curioſity of the Spaniards: they tried to diſcover whether theſe people had not in their poſſeſſion, or whether their country did not produce pearls, or ſome precious ſtones: their reſearches were fruitleſs, they only found ſome ſtones which they judged to be metallic, and which they carried on board, not having the neceſſary means for extracting the metal they might contain.

The inhabitants of La Cruz feed upon fiſh, freſh or dry, boiled or roaſted; herbs and roots which their mountains yield them, and particularly that which in Spain is called ſea parſley; and, laſtly, upon the fleſh of animals which they take in hunting: the productions of the chaſe are undoubtedly abundant, ſeeing the number of dogs they keep for this purpoſe.

They appeared to the Spaniards to worſhip the ſun, the earlieſt and moſt natural of all idolatrous worſhip; and they paid a decent reſpect to the remains of their dead. Don Maurelle, one of the Spaniſh officers, in an expedition round the gulf, found in two iſlands three dead bodies laid in boxes of a ſimilar form to thoſe which have been deſcribed above, though conſiderably larger, and decked in their furs. Theſe biers were placed in a little hut upon a platform, or raiſed floor, made of the branches of trees.

The country is very hilly; the mountains are lofty, and their ſlope extends almoſt everywhere to the ſea. The ſoil is lime-ſtone; it is nevertheleſs covered with an impenetrable foreſt of tall fir trees, very large and very ſtraight. As theſe trees cannot ſtrike very deep into the earth, the violence of the wind often tears them up by the roots: they rot and become a light mould, upon which grows a buſhy thicket; and in this are found nettles, chamomile, wild celery, aniſe, a ſpecies of cabbage, celandine, elder, wormwood, ſorrel; and without doubt there are other plants along the rivers.

The Spaniards ſaw ducks, gulls, divers, kites, ravens, geeſe, ſtorks, gold-finches, and other little birds unknown to them.

The commerce between the Spaniards and the Indians was quite undiſturbed; and ſo deſirous were the latter to obtain iron, cloths, and other ſtuffs, that they ſold their children for broken iron hoops and other wares. The Spaniards in this manner bought three young lads, one from five to ſix years old, another of four, and the third from nine to ten, not to make ſlaves, but Chriſtians of them; they hoped beſides to derive uſeful information from them as to the nature of the country and its inhabitants. Theſe youths were ſo contented in being with the Spaniards, that they hid themſelves when their parents came on board, from the apprehenſion of being again reſtored to them. Two young girls were alſo purchaſed with the ſame view; one very ugly, ſeven years of age; the other younger, better made, but ſickly, and almoſt at the gates of death.

At the full and change of the moon, the ſea riſes in the harbour of La Cruz ſeventeen feet three inches Engliſh; it is then high water at a quarter after 12 at noon; the loweſt tides are fourteen feet three inches; the night tides exceed by one foot nine inches thoſe of the day.

CRYMODES, among phyſicians, a kind of fever attended with a ſhivering cold, and inflammation of the internal parts of the body.

CRYPTA, a ſubterraneous cell or vault, eſpecially under a church, for the interment of particular families or perſons. S. Ciampini, deſcribing the outſide of the Vatican, ſpeaks of the *cryptæ* of St Andrew, St Paul &c. The word is formed of κρυπτω, *abſcondo*, "I hide;" whence κρυπτη, *crypta*.

Vitruvius uſes the word *crypta* for a part of a building, anſwering nearly to our cella; Juvenal for a *cloaca*. Hence *crypto-porticus*, a ſubterraneous place arched or vaulted, uſed as an under-work or paſſage in old walls. The ſame is alſo uſed for the decoration at the entry of a grotto.

CRYPTA is alſo uſed by ſome of our ancient writers for a chapel or oratory under ground.

CRYPTÆ, in *Anatomy*, a name given by Ruyſch to glands ſituated on the back of the tongue, and to glands of the inteſtines.

CRYPTOGAMIA, (from κρυπτος, *occultus*, "concealed," and γαμος, *nuptia*, "nuptials"), the 24th claſs in the Linnæan ſyſtem, comprehending thoſe plants whoſe fructification is concealed, either through minuteneſs, or within the fruit. See BOTANY *Index*.

CRYPTOGRAPHY, the art of writing in cipher, or with ſympathetic ink. Among the methods which Ovid teaches young women to deceive their guardians, when they write to their lovers, he mentions that of writing with new milk, and of making the writing legible by means of coal duſt or ſoot; from which it appears, that the uſe of ſympathetic ink was known to the ancients.

Tuta quoque eſt, fallitque oculos, è lacte recenti
Litera: carbonis pulvere tange; leges.

De Arte Amandi, lib. iii.

Auſonius propoſes the ſame means to Paulinus in the two following verſes:

Lacte incide notas; areſcens charta tenebit
Semper inaſpicuas; prodentur ſcripta favillis.

Epiſt. xxiii.

But it would appear, that the commentators on this poet have miſtaken the meaning of the word *favilla*, which is uſed here to ſignify *fuligo*, or ſoot: and in the ſame ſenſe it is often employed by other poets. Columella, ſpeaking of the method of preſerving plants from inſects with ſoot, calls it *nigra favilla*. In another place he mentions the ſame practice, and ſays *fuliginem quæ ſupra focos tectis inhæret*. Other glutinous juices beſides milk may be employed for the ſame purpoſe, as they will equally hold faſt the black powder ſtrewed over them. Pliny, therefore, recommends the milky juice of certain plants, and particularly mentions that of lettuce, to produce this effect.

It is now well known that ſeveral metallic ſolutions may be employed for a ſimilar purpoſe, and being expoſed to the action of certain vapours, the characters which are written with them become viſible. This effect was perhaps accidentally diſcovered; but it does not appear to be of great antiquity. In a book *De ſecretis*, compiled by Wecker from Porta, Cardan, and ſome other old writers, and printed in 1592, there is no mention of it; nor even is it noticed by Caneparius in his book *de Atramentis*, printed in 1619. The firſt receipt given for the preparation of a ſympathetic ink is in a book by Peter Borel printed at Paris in 1653, where it is called *magnetic water which acts at a diſtance*. *Beckmann. Hiſt. of Inven*. See CHEMISTRY *Index*, CIPHER, and INK.

CRYSTAL, in its original meaning, ſignified *ice*. It was afterwards applied to rock cryſtal, or cryſtallized ſiliceous earth; for the ancients, according to Pliny, regarded that body, as water which was congealed by the action of cold.

CRYSTAL, a ſpecies of ſtone belonging to the quartz or ſiliceous genus. It always appears, where there has been no interruption to its cryſtallization, in hexagonal priſms pointed at both ends. It is found of different kinds and colours. 1. Opaque or ſemitranſparent, and white or of a milk colour. 2. Opaque and red, or of a carnelian colour, from Oran in Barbary. 3. Opaque and black, from the ſame place. 4. Clear. The ſpecific gravity of theſe kinds of cryſtals is from 2650 to 2700. Profeſſor Bergman extracted from them about ſix parts of argilla and one of calcareous earth per hundred weight; but Mr Gerhard found ſome ſo pure as to contain neither. 5. Clear and blackiſh brown; the ſmoky topaz, or *rauch topaz* of the Germans. It is found at Egan in Norway, and at Loviſa in Finland. Theſe cryſtals are ſaid to become clear by boiling them in tallow. 6. Clear and yellow; found in Bohemia, and ſold inſtead of topazes. 7. Clear and violet-coloured; the amethyſt from Saxony, Bohemia, and Dannemore in Upland. The moſt tranſparent of theſe are called falſe diamonds, Briſtol, Kerry ſtones, Alençon diamonds, &c. 8. Colourleſs rock cryſtal, properly ſo called, found in Bohemia, the province of Jemtland, and many other places. 9. Pyramidal cryſtal with one or two points. Theſe have no priſmatic ſhape, but either ſtand upon a baſe in cavities of quartz veins, have only a ſingle pyramid, and are of various colours; or they lie in clayey earths, and have both pyramids, but no priſm. They are found at Blackenburg upon the Hartz, and at Morſcroſh in the Silverland in Tranſylvania.

The coloured tranſparent cryſtals derive their tinge from an exceedingly ſmall portion of metallic oxide, but loſe them entirely when ſtrongly heated. They are called *falſe gems;* viz. the red from Oran in Barbary, falſe rubies; the yellow from Saxony, falſe topazes; the green from Dauphiny, very rare, falſe emeralds or praſes; the violet from Vil in Catalonia, falſe amethyſts; the blue from Puy in Valais in France, falſe ſapphires. There are likewiſe opal or rainbow cryſtals, the various colours of which are thrown out in zones acroſs the ſurface. They make a very fine appearance, though they never ſhine like the oriental opal.

M. Fourcroy makes a remarkable difference between the cryſtals and quartz, by affirming that the former are unalterable in the fire, in which they neither loſe their hardneſs, tranſparency nor colour; while the quartz loſes the ſame qualities, and is reduced by it to a white and opaque earth. He claſſes the rock cryſtals,

I. According to their form, viz. 1. Inſulated hexagonal cryſtals ending in pyramids of ſix faces, which have a double refraction, or ſhow two images of the ſame object when looked through. 2. Hexagonal cryſtals united, having one or two points. 3. Tetraedral, dodecaedral, flatted cryſtals; and which, though hexagonal, have nevertheleſs their planes irregular. 4. Cryſtals in large maſſes, from the iſland of Madagaſcar, which have a ſimple refraction.

II. With regard to their colour, as being either diaphanous, reddiſh, ſmoky, or blackiſh.

III. With regard to accidental changes, ſome are hollow; ſome contain water within one or more cavities: ſome are caſed one within the other; ſome are of a round form, as the pebbles of the Rhine; ſome have a cruſt of metallic calces or of a pyrites; ſome are found cryſtallized in the inſide of a cavity; while ſome ſeem to contain amianthus or aſbeſtus; and others contain ſhirls. The ſame author reckons among cryſtals the oriental topaz, the hyacinth, the oriental ſapphire, and the amethyſt. M. Daubenton has always looked upon this laſt as a quartz of a cryſtal.

When the rock cryſtals are ſemitranſparent or intermixed with opaque veins, they are called by the Swediſh lapidaries *milk-cryſtals.* When they are found in the form of round pebbles, which is occaſioned by their being toſſed about and rubbed againſt one another by floods or by the ſea, they are called by the Engliſh lapidaries *pebble-cryſtals.* They come from the Indies, Siberia, and other places.

According to Bomare, the rock-cryſtals are generally formed upon or among quartz, which ſhows their great affinity, and are to be found in all parts of the world. The greateſt quantity of them is brought from Mount Saint Gothard in Switzerland. Large pieces of theſe, weighing from 5 to 800 pounds, were found there at Grimſelberg: another of about 1200 pounds weight was found ſome years ago at Fiſbach in the Valais: and a piece ſix feet long, four wide, and equally thick, was found in the iſland of Madagaſcar, where theſe natural productions are of the moſt extraordinary ſize and perfection.

In the imperial collection at Vienna, there is a pyramidal cryſtal vaſe two ells in height, cut wholly out of one piece. It is uſual with the largeſt cryſtals of the German mountains to be full of cracks and flaws, and to be ſo conſtructed internally as to ſhow all the priſmatic colours; but the above-mentioned ones were quite free from theſe blemiſhes, and reſembled columns of the pureſt glaſs, only much clearer than any glaſs can be made. Cryſtal is alſo found in many parts of Britain and Ireland. About Briſtol it is found of an amethyſtine tinge. In Sileſia and Bohemia in Germany it is found ſtained with the colours of the ruby, ſapphire, emerald, and topaz; in which caſe jewellers take great advantage of it, ſelling it under the name of *occidental ſapphire.*

The orders of pure cryſtal are three: the firſt is perfect columnar cryſtals, with double pyramids, compoſed of 18 planes, in an hexangular column, terminated by an hexangular pyramid at each end: the ſecond order is that of perfect cryſtals, with double pyramids, without a column, compoſed either of 12 or of 16 planes, in two hexangular pyramids, joined cloſely baſe to baſe, without the intervention of any column: the third order is that of imperfect cryſtals, with ſingle pyramids, compoſed either of 12 or 10 planes, in an hexangular or pentangular column, affixed irregularly at one end to ſome ſolid body, and terminated at the other by an hexangular or pentangular pyramid.

Theſe are all the general forms into which cryſtal, when pure, is found concreted; but under theſe there are almoſt infinite varieties in the number of angles, and the length, thickneſs, and other accidents of the columns and pyramids.

When cryſtal is blended with metalline particles at the time of its formation, it aſſumes a variety of figures wholly different from theſe, conſtituting a fourth order, under the name of *metalline cryſtals:* when that metal is lead, the cryſtal aſſumes the form of a cube: when it is tin, of a quadrilateral pyramid, with a broad baſe; when iron, the cryſtal is found concreted in rhomboidal figures: theſe cryſtals are very common about mines; but the common ſpars, which are liable to be influenced in the ſame manner by the metals, and to appear in the very ſame form, are to be carefully diſtinguiſhed from them. There is one very eaſy teſt for this purpoſe, which is, that all ſpars are ſubject to be diſſolved by aquafortis, and effervеſce violently only on its touching them: but it has no ſuch effects on cryſtal.

The pebble-cryſtal is common enough in all parts of the world; but that which is formed of hexangular columns, affixed to a ſolid baſe at one end, and terminated by a hexangular column at the other, is infinitely more ſo: this is what we call *ſprig* or *rock cryſtal,* and is the ſpecies deſcribed by moſt authors under the name of *cryſtal of the ſhops,* or that kept for medicinal uſes.

With regard to the formation of cryſtals, it is certain that they muſt have been once in a ſoft ſtate, ſince ſome are found to have water in their cavities. Profeſſor Bergman obtained 13 regular formed cryſtals, by ſuffering the powder of quartz to remain in a veſſel with fluor acid for two years. Theſe were about the ſize of ſmall peas, and were leſs hard than quartz. Mr Magellan informs us, that he received from Mr

Achard two cryſtals, one of the ſparry kind, and the other as hard and tranſparent as rock cryſtal. The firſt he procured by means of calcareous earth, and the latter from the earth of alum, both diſſolved in water impregnated with fixed air, the water filtrating very ſlowly through a porous bottom of baked clay. The apparatus is deſcribed by the author in the *Journal de Phyſique* for January 1778: but though the proceſs was attempted by Mr Magellan, and afterwards a ſecond time by Mr Achard himſelf, neither of them were able to ſucceed. Mr Morveau, however, in the firſt volume of the Dijon Memoirs for 1785, aſſerts that he has produced a very ſmall artificial cryſtal; and gives the proper method for ſucceeding in the proceſs.

Cryſtal is frequently cut; and luſtres, vaſes, and toys, are made of it as of other beautiful ſtones. For this purpoſe it is to be choſen perfectly clear and tranſparent. It is to be tried by aquafortis, or by drawing it along a pane of glaſs. The genuine cryſtal will not be affected by the acid, and will cut glaſs almoſt like a diamond. When any piece of workmanſhip of natural cryſtal is become foul and dark, the following method is to be uſed for recovering its brightneſs without hurting the poliſh. Mix together ſix parts of common water and one part of brandy; boil theſe over a briſk fire, and let the cryſtal be kept in it, in a boiling ſtate, a quarter of an hour; then take it out and rub it carefully over with a bruſh dipped in the ſame liquor; after this it is to be wiped with a napkin, and by that means its ſurface will be perfectly cleaned, and rendered as bright as at firſt, without any injury to the points of the cutting or the poliſh of the planes or faces, which would probably have happened had the cleaning been attempted by mere rubbing with a cloth.

Natural cryſtal may be reduced by calcination into a ſtate proper for making glaſs with alkaline ſalts, and thus becomes a very valuable frit. The method of doing it is as follows: calcine natural cryſtal in a crucible; when it is red hot, throw it into cold water. Repeat this eight times, covering the crucible, that no duſt or aſhes may get in among the cryſtal. Dry this calcined maſs, and reduce it to an impalpable powder.

Colouring CRYSTAL, for the imitation of gems. See DOUBLET.

CRYSTAL is alſo uſed for a factitious body, caſt in glaſs-houſes, called *cryſtal-glaſs*, being in fact no more than glaſs carried, in the compoſition and manufacture, to a greater perfection than the common-glaſs.

The beſt kind of glaſs-cryſtal is that called *Venice-cryſtal*, made at Moran near Venice. See GLASS.

Iſland or *Iceland* CRYSTAL, a tranſparent fiſſile ſtone, brought from Iceland, ſoft as talc, clear as rock cryſtal, and without colour, remarkable for its unuſual refractions. It is a carbonate of lime.

It is there found in great abundance all over the country, but is particularly plentiful in a mountain, not far from the bay of Roezſiord, where the fineſt and moſt pellucid pieces are found on digging. The mountain lies in 65 degrees latitude, and has its whole outſide made up of it; but though this makes a very bright and glittering appearance, it is not ſo fine as that which lies at a little depth, and is met with on opening the ſurface. This is generally taken up out of the earth in maſſes a foot long, and its corners very frequently are terminated in theſe large maſſes by a ſort of cryſtals, very different in figure and qualities from the reſt of the maſs. The ſtone itſelf is of a parallelopiped figure; but theſe excreſcences are either ſingle pyramids, affixed to columns like common cryſtal, or double pyramids with or without columns between. The ſtone itſelf is ſoft; theſe are hard, and cut glaſs: the ſtone calcines to lime in the fire; theſe run into glaſs: in ſhort, the ſtone itſelf is true ſpar, and theſe are true cryſtal. Beſide theſe, there ſometimes grows out of the end of the larger maſſes a pure fine aſbeſtos. This likewiſe is the caſe ſometimes in the ſpar found about Bareges in France, and ſhows how nearly together the formation of bodies, wholly different from one another, may happen. The general figure of the ſtone is parallelopiped; or, as ſome expreſs it, rhomboid: and it retains this not only while whole, but alſo when broken to pieces; every fragment it naturally falls into, though ever ſo ſmall, being truly of that ſhape. But it is remarkable, that in ſome places of this mountain the ſame ſort of matter is found in form of triangular pyramids, all which have the ſame property of the double refraction with the parallelopipeds of the ſame ſubſtance; ſo that the original error of ſuppoſing its qualities owing to its ſhape, is refuted by this, as well as by the trials made with other pellucid bodies of the ſame figure, which do not ſhow this remarkable property.

The Iceland cryſtal is electrical, and when rubbed will attract ſtraws, feathers, and other light ſubſtances, in the ſame manner that amber does.

The vaſt maſſes of white ſpar which are found in the lead mines of Derbyſhire, though they are not externally of the parallelopiped figure of the Iceland cryſtal, nor have any thing of its brightneſs or tranſparence in the general lump; yet when they are broken they ſeparate into rhomboidal fragments, and ſome of theſe are found to be tolerably pellucid: all thoſe which are ſo have the property of the Iceland cryſtal; and being laid upon paper where a black line is drawn, they all ſhow that line double, in the ſame manner as the real Iceland cryſtal does.

Iceland cryſtal bears a red heat without loſing its tranſparency; and in a very intenſe heat calcines without fuſion: ſteeped a day or two in water, it loſes its natural poliſh. It is very ſoft and eaſily ſcratched with the point of a pin: it will not give fire on being ſtruck againſt ſteel; and ferments and is perfectly diſſolved in aquafortis. It is found in Iceland, from whence it has its name; and in France, Germany, and many other places. In England fragments of other ſpars are very often miſtaken for it, many of them having in ſome degree the ſame property. It has none of the diſtinguiſhing characters of cryſtal; and is plainly a genus of ſpars, called from their figure *parallelopipedia*, which, as well as ſome other bodies of a different genus, have the ſame properties. Bartholine, Huygens, and Sir Iſaac Newton, have deſcribed the body at large, but have accounted it either a cryſtal or a talc; errors which could not have happened, had the criterions of foſſils been at that time fixed; ſince Sir Iſaac Newton has recorded its property of efferveſcing with nitric acid, which alone muſt prove that it is neither

talc

tale nor cryſtal, both thoſe bodies being wholly unaffected by that menſtruum. It is always found in form of an oblique parallelopiped, with ſix ſides; and is found of various ſizes, from a quarter of an inch to three inches or more in diameter. It is pellucid, and not much leſs bright than the pureſt cryſtal; and its planes are all tolerably ſmooth, though when nicely viewed they are found to be waved with crooked lines made by the edges of imperfect plates. What appears very ſingular in the ſtructure of this body is, that all the ſurfaces are placed in the ſame manner, and conſequently it will ſplit off into thin plates, either horizontally or perpendicularly; but this is found, on a microſcopic examination, to be owing to the regularity of figure, ſmoothneſs of ſurface, and nice joining of the ſeveral ſmall parallelopiped concretions, of which the whole is compoſed; and to the ſame cauſe is probably owing its remarkable property in refraction.

The phenomena of this ſtone are very remarkable, were firſt ſuggeſted by Bartholin, and have been examined with great accuracy by Mr Huygens and Sir Iſaac Newton.

1. Whereas in other pellucid bodies there is only one refraction, in this there are two; ſo that objects viewed through it appear double.

2. Whereas in other tranſparent bodies, a ray falling perpendicularly on the ſurface, paſſes ſtraight through, without ſuffering any refraction, and an oblique ray is always divided; in Iceland cryſtal, every ray, whether perpendicular or oblique, becomes divided into two, by means of the double refraction. One of theſe refractions is, according to the ordinary rule, the ſine of incidence out of air into cryſtal, being to the ſine of refraction as five to three; but the other is perfectly new. The like double refraction is alſo obſerved in cryſtal of the rock, though much leſs ſenſibly. When an incident ray is thus divided, and each moiety arrives at the farther ſurface, that refracted in the firſt ſurface after the uſual manner, is refracted entirely after the uſual manner at the ſecond; and that refracted in the unuſual manner in the firſt is entirely refracted after the like manner in the ſecond; ſo that each emerges out of the ſecond ſurface parallel to the firſt incident ray. Again, if two pieces of this cryſtal be placed over each other, ſo that the ſurfaces of the one be parallel to the correſponding ones of the other; the rays refracted in the uſual manner in the firſt ſurface of the firſt, are refracted after the uſual manner in all the other ſurfaces; and the ſame uniformity appears in the rays refracted after the unuſual manner; and this in any inclination of the ſurfaces, provided their planes of perpendicular refraction be parallel.

From theſe phenomena Sir Iſaac Newton infers, that there is an original difference in the rays of light; by means whereof ſome are here conſtantly refracted after the uſual manner; and others in the unuſual manner. Were not the difference original, and did it ariſe from any new modifications impreſſed on the rays at their firſt refraction, it would be altered by new modifications in the three following ones; whereas, in fact, it ſuffers no alteration at all. Again, he hence takes occaſion to ſuſpect, that the rays of light have ſeveral ſides, endued with ſeveral original properties: for it appears from the circumſtances, that theſe are not two ſorts of rays differing in their nature from each other, one conſtantly, in all poſitions, refracted in the uſual, and the other in the unuſual manner; the difference in the experiment mentioned being only in the poſition of the ſides of the rays to the plane of perpendicular refraction. For one and the ſame ray is refracted ſometimes after the uſual, and ſometimes after the unuſual manner, according to the poſition of its ſides to the cryſtal: the refraction being alike in both, when the ſides of the rays are poſited the ſame way to both, but different when different. Every ray therefore may be conſidered as having four ſides or quarters; two of which, oppoſite to each other, diſpoſe the ray to be refracted after the unuſual manner; and the other two in the uſual. Theſe diſpoſitions, being in the rays before their incidence on the ſecond, third, and fourth ſurfaces, and ſuffering no alterations; for what appears in their paſſage through them muſt be original and connate.

Father Beccaria corrects the obſervations of Huygens and Newton concerning the refraction of rock or mountain cryſtal. The double refraction of the latter happens when a ray paſſes through two ſides that are inclined to each other, and conſequently iſſues coloured: whereas that of the Iceland cryſtal is made by the paſſage of a ray through two parallel ſides, and therefore it iſſues colourleſs. He ſuggeſts, that there may be other ſubſtances in which there is a manifold refraction. Graveſande had a priſm of Braſil pebble, which had a double refraction at each angle, but of a different kind from one another. Mr B. Martin prepared ſeveral priſms of Iceland cryſtal, which exhibited not only a double but a multiple refraction. A ſingle priſm produced a ſix-fold refraction; and by combining ſeveral priſms, a number of refractions was obtained equal to the product of thoſe of the ſingle priſms; i. e. a priſm which afforded two images applied to one of ſix, produced a priſm of twelve images, &c. He farther obſerves, with reſpect to Iceland cryſtal, that though the ſides of its plane of perpendicular refraction be parallel to one another, a beam of light tranſmitted through them will not be colourleſs; in which property it differs from all other known ſubſtances.

CRYSTALLINE, in general, ſomething compoſed of or reſembling cryſtal. See CRYSTAL.

CRYSTALLINE Heavens, in *Ancient Aſtronomy*, two ſpheres imagined between the primum mobile and the firmament, in the Ptolemaic ſyſtem, which ſuppoſes the heavens ſolid, and only ſuſceptible of a ſingle motion. See ASTRONOMY.

CRYSTALLINE Humour. See ANATOMY *Index*.

CRYSTALLINÆ, or CRYSTALLINES, in *Medicine*, are puſtules filled with water, and ſo called on account of their tranſparency. They are one of the worſt ſymptoms attendant on a gonorrhœa. They are lodged on the prepuce, without pain; and though cauſed by coition, have nothing of infection attending them. The cauſe is ſuppoſed to be a contuſion of the lymphatic veſſels in the part affected. Dr Cockburn, who hath deſcribed this caſe, recommends for the cure a mixture of three parts of lime-water and two of rectified ſpirit of wine, to be uſed warm, as a lotion, three times a-day.

CRYSTALLIZATION.

CRYSTALLIZATION is the ſymmetrical arrangement of the particles of a body when it paſſes from the liquid to the ſolid form. 1 Definition. This arrangement is determined by the mutual action of the ſmall ſolids of which the body is compoſed; and theſe ſolids are ſeparated from the liquid by their force of coheſion. Cryſtallization is one of the moſt remarkable effects of coheſion. The qualities of a ſolid in which the force of coheſion is more eaſily overcome in one direction than another; its brittleneſs, elaſticity, and ductility, depend on this arrangement of its particles.

2 Bodies which cryſtallize muſt be ſuſceptible of

Solid bodies are found either in irregular maſſes, or exhibit certain determinate forms by the proceſs of cryſtallization. Thoſe ſubſtances which are capable of aſſuming regular figures, uniformly affect the ſame form; ſubject, however, to certain deviations, from the operation of particular circumſtances. Thoſe bodies only can aſſume the form of cryſtals which are ſuſceptible of being reduced to the fluid ſtate. This is the uſual method of cryſtallizing ſaline ſubſtances. The ſubſtance to be cryſtallized is diſſolved in a ſufficient quantity of water to retain it in ſolution. This is ſlowly evaporated; and as the bulk of the fluid is diminiſhed, the particles are brought nearer to each other; they combine together by the force of coheſion, and form cryſtals. 3 ſolution; Some ſaline bodies, which diſſolve but in ſmall proportion in cold water, are found to be very ſoluble in hot water. But when this water cools, it is no longer capable of holding them in ſolution. The particles then gradually approach each other, and arrange themſelves into certain determinate forms; or they cryſtallize. Many of the ſaline bodies which cryſtallize in this manner, combine with a conſiderable portion of water. This is called the *water of cryſtallization*. Other ſaline ſubſtances are equally ſoluble in hot and cold water. Theſe ſubſtances do not cryſtallize by cooling the fluid; they aſſume regular forms only by diminiſhing its quantity. This is effected by means of evaporation by the application of heat. In ſalts which are cryſtallized in theſe circumſtances, the proportion of water which enters into combination is ſmall.

4 or fuſion.

There are ſome claſſes of bodies which aſſume regular forms, but are not ſoluble in any liquid. Such, for inſtance, are metallic ſubſtances, glaſs, and ſome other bodies. Subſtances of this nature are cryſtallized, by being previouſly ſubjected to fuſion; and thus having combined with caloric, they are reduced to the liquid ſtate, and the particles being ſeparated from each other are left at liberty to arrange themſelves into regular forms, or to cryſtallize, as the body cools.

5 Conjectures about the cauſe.

But what is the cauſe which operates in determining the regular arrangement of the particles of bodies in theſe circumſtances? or what is the cauſe of the ſame bodies in the ſame circumſtances aſſuming regular figures? The ancient philoſophers ſuppoſed that the elements of bodies conſiſted of certain regular geometrical figures; but it does not appear that they applied this theory to explain cryſtallization. The ſchoolmen aſcribed the regular figure of cryſtals to their ſubſtantial forms; and others ſuppoſed that it depended merely on the aggregation of the particles, but without explaining to what this aggregation was owing, or the reaſon of the regular figures thus produced. 6 Newton's. According to Sir Iſaac Newton and the theory of Boſcovich, the particles of bodies held in ſolution in a fluid, are arranged at regular diſtances, and in regular order; and when the force of coheſion between the particles and the fluid is diminiſhed, it is increaſed between the particles themſelves. Thus they ſeparate from the fluid, and combine together in groups which are compoſed of the particles neareſt to each other. If we ſuppoſe that the particles compoſing the ſame body have the ſame figure, the aggregation of any determinate number of ſuch particles will produce ſimilar figures. Bergman is of opinion that the particles of ſaline ſubſtances poſſeſs a double tendency: by the one they arrange themſelves in the form of ſpiculæ; and by the other, theſe ſpiculæ arrange themſelves at certain angles of inclination, and according to the difference of theſe angles, different forms of cryſtals are produced. Theſe effects are aſcribed by the ingenious author to the mutual attraction which exiſts between the particles, which, according to the peculiar figures of the atoms, at one time arranges them in the form of ſpiculæ, and then combines the ſpiculæ thus formed under different angles of inclination. 7 Bergman's. But this arrangement of the particles, or tendency to arrangement, aſſigned by Bergman as a cauſe, is only explaining the phenomenon by itſelf; while the cauſe of the tendency is yet unexplained. Nor will Newton's hypotheſis be more ſatisfactory; for if the particles of a body, after being equally diffuſed in a fluid, are brought together by a general attraction, it will follow that every ſaline body ſhould cryſtallize in the ſame manner.

8 Hauy's.

According to the ingenious theory which has been propoſed by Hauy, the integrant particles always combine in the ſame body in the ſame way; the ſame faces and the ſame edges are always attracted towards each other. But theſe faces and edges are different in different cryſtals; and hence originates that variety of forms which different bodies aſſuming regular figures by cryſtallization exhibit. But why are the ſame edges and the ſame faces attracted in the ſame way? This ſtill wants explanation. If it be aſcribed, as ſome have ſuppoſed, to a certain degree of polarity exiſting among the particles, it might enable us to account for the regular figures of bodies produced by the proceſs of cryſtallization. For by the effects of this agent we might ſuppoſe that different parts of the particles of bodies are endowed with different forces; one an attractive, and another a repulſive force; and by the action of theſe two forces, the ſame arrangement of the particles will uniformly take place; for when one part of a particle is attracted, the other will be invariably repelled; and thus the ſame faces and edges will always be diſpoſed in the ſame way. But it ought to be obſerved that the exiſtence of this power, however ſatisfactorily

factorily it might account for the phenomena, has by no means been proved; and even if its exiſtence were completely eſtabliſhed, the difficulty ſtill remains how this polarity is to be explained.

Without entering farther into theſe ſpeculations, we propoſe, in the two following ſections, to preſent our readers with a comprehenſive view of the formation and ſtructure of cryſtallized bodies. In the firſt ſection we ſhall treat of the phenomena of cryſtallization, the means of conducting this proceſs to obtain the moſt perfect cryſtals, and the modifications of which each of the forms is ſuſceptible. In the ſecond we ſhall give a ſhort view of the theory of the ſtructure of cryſtals.

Sect. I. *Of the Phenomena of Cryſtallization, and the modifications to which it is ſubject.*

THE moſt complete ſet of obſervations which has yet appeared on this branch of practical chemiſtry has been made by M. Leblanc; and to his ingenious memoir † we muſt acknowledge ourſelves indebted for what we now lay before our readers that is new or intereſting on this ſubject. This art, he obſerves, of managing or conducting the cryſtallization of ſalts, is in a great meaſure new; for it has hitherto attracted little attention.

9
Conditions.

To inſure ſucceſs in obtaining perfect cryſtals, the proceſs muſt be conducted in flat-bottomed veſſels; and veſſels of glaſs or porcelain are found preferable to thoſe of any other materials for this purpoſe. The ſalt employed ſhould be in a ſtate of purity; and to favour the increaſe and regular form of the cryſtals, they are to be placed at a diſtance from each other in the veſſels containing the ſolution. To theſe neceſſary precautions, it may be added, that the veſſels in which the evaporation goes on ſhould be at perfect reſt, and that it is requiſite to obſerve the denſity, or ſpecific gravity, at which the ſolution begins to yield cryſtals.

10
Preparation of the ſolution.

The particles of any ſaline body cannot come into contact and form cryſtals, as long as the force of affinity between theſe particles and the fluid in which they are held in ſolution is greater than the mutual affinity of the particles among themſelves. A ſalt, for inſtance, which begins to cryſtallize at a certain ſpecific gravity of its ſolution in water, will afford no cryſtals when that ſpecific gravity is diminiſhed; for then the particles of the ſalt are removed to a greater diſtance from each other; and while by this diſtance, the force of their mutual attraction is diminiſhed, the attraction between theſe particles and the water in which they are diſſolved is increaſed by the increaſe of the quantity of the ſolvent. But, on the other hand, if a ſolution which begins to cryſtallize at a certain ſpecific gravity, is more concentrated, the cryſtals which are thus obtained are greatly multiplied, but they are heaped together in confuſed maſſes, exhibiting no regular forms. Thus, a ſolution which has been ſcarcely reduced to that degree of concentration at which it begins to cryſtallize, being poured while it is hot into the proper veſſel for carrying on the proceſs, or left at reſt in the ſame veſſel in which the ſolution is made, to cool ſlowly, will yield a ſmall number of cryſtals, which will have no other defects than what are occaſioned by their contact with the veſſel. Even perfect cryſtals will be ſometimes found among the ſmaller ones. When the concentration of the ſolution has not been carried too far, or not farther than what is effected by ſlow cooling, not only have the embryo cryſtals leſs bulk, but the particles having come into contact ſlowly and without confuſion, they poſſeſs a greater degree of tranſparency. After a certain period, which varies according to the ſpecies of ſalt which is ſubjected to the operation, ſmall cryſtals may be diſtinctly obſerved. Theſe are to be carefully detached from each other, and placed in a different poſition. Being placed by this management on a different ſide, the defects occaſioned by their contact with the veſſel are ſoon repaired. From the cryſtals treated in this way, the fineſt and moſt perfect are to be obtained. This operation of changing the poſition of the cryſtal from one ſide to the other, ought to be repeated at leaſt once every day, if we wiſh to obtain the completeſt cryſtals.

At the end of a certain period, the ſmall cryſtals are to be removed, that the fluid may be more concentrated, either by a new evaporation, or by diſſolving a new portion of the ſame ſalt. After the new ſolution has cooled, and the cryſtals which have formed in it are ſeparated, if it has been too much concentrated, or too great a portion of ſalt has been added; the cryſtals of the firſt ſolution are then to be introduced and treated in the ſame way as formerly.

11
Management of the cryſtals,

When the cryſtals have acquired a ſufficient volume to handle them, and to chooſe ſuch as we wiſh ſhould increaſe to the largeſt ſize, either as ſimple or complete cryſtals, or as exhibiting varieties from poſition or particular circumſtances, the individual cryſtals are then to be ſeparated, and ſolutions are to be prepared for them and brought to ſuch a degree of concentration as to afford cryſtals in a maſs; which latter being removed, the ſingle cryſtals are introduced into theſe ſolutions, which are now in a proper ſtate to favour their increaſe. The cryſtals may be either previouſly diſpoſed in the veſſel, and then the ſolution may be poured on; or, having firſt introduced the latter, they may be afterwards diſtributed on the bottom of the veſſel. And thus by continuing the ſame proceſs, by taking care to change the poſition of the cryſtal from one ſide to the other frequently, and by keeping up the ſolution to a proper degree of ſtrength, we may obtain cryſtals of any bulk we chooſe.

12
which decreaſe if left too long in the ſolution.

When the quantity of particles, which in a certain ſtate of concentration continue to be mutually attracted, has diminiſhed in conſequence of their accumulation on the cryſtals which are formed, at a certain ſtage of this diminution the cryſtals ceaſe to enlarge or increaſe in bulk; it happens, on the contrary, if they are left in the fluid, that they begin to diſſolve. It is uſually on the corners and angles that this decreaſe takes place; and in ſome ſalts it ſeems to go on piecemeal, ſo as to preſent diſtinct layers of the particles; for in this caſe lines parallel to the ſides may be obſerved, and theſe are diſpoſed like ſteps of ſtairs. Should the accident which is here alluded to be allowed to go on too far, it may often require a long time to repair it; but it is in general eaſy to avoid this inconvenience, by watching the progreſs of the operation and the increaſe of the cryſtals. If their corners or angles are obſerved to become leſs ſharp, they muſt be removed till the fluid is farther concentrated, or they muſt be introduced into a new ſolution of the ſame ſalt of the proper degree of ſtrength. To prepare the new ſolution for the increaſe of the cryſtals, a quantity of the ſame ſalt is to be diſſolved in a given portion of water, ſo that it ſhall be fully ſaturated. It is then allowed to cool and cryſtallize. The cryſtals being ſeparated, the remaining ſolution is to be employed in ſuch quantity as may be judged neceſſary to replace that in which the diminution of the cryſtals had commenced.

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† *Jour. de Phyſique*, tome lv. 300.

Sometimes it happens, from want of neceſſary precaution, that the new ſolution in which the proceſs is to be conducted, either being too much ſaturated, or being diſturbed by pouring from one veſſel to another, exhibits many other points of attraction beſide the cryſtals whoſe increaſe is propoſed. In this caſe a great number of ſmall cryſtals make their appearance, and cover the ſurface of the former with a kind of incruſtation. The ſmall cryſtals, provided they are taken in time, may be removed without injury to the others; if not, they will be unavoidably ſpoiled.

13
Their poſition muſt be changed.

When the cryſtals have reached ſuch a ſize as that they may be placed one by one, without being in contact with each other, we muſt ſtill continue frequently to change their poſition. This may be done with a ſpatula, a glaſs rod, or with any inſtrument which will communicate nothing to the fluid. In this way the ſides of the cryſtal which are alternately in contact with the bottom of the veſſel will increaſe in equal proportion, and it will always remain complete.

It is chiefly in ſalts which furniſh elongated priſms that the influence of poſition may be moſt diſtinctly ſeen. If, for inſtance, a cryſtal before it has acquired much volume is found to reſt on one of its baſes as well as on one of its ſides, it will be obſerved to be compreſſed in the direction from baſe to baſe; and it will appear to be only a regular ſegment of the cryſtal, which having been placed on one of its ſides has obtained a great bulk. If we take a ſix-ſided priſm whoſe ſummits are obliquely truncated, and if it be placed on one of its ſides, it will enlarge in a greater or leſs degree, but always in ſuch a manner that the diſtance from one baſe to the other ſhall never be leſs than the diſtance between the ſides. But if the poſition be on one of its baſes, then its principal increaſe will be in the direction of the ſides, and it will appear to be compreſſed between the baſes. At firſt ſight, a cryſtal treated in this way will ſeem different from the former. For the corners form the ſummit of apparent pyramids which are ſeparated by a four-ſided priſm. This circumſtance affords a ſufficient explanation of one of the cauſes which produce varieties in the appearances of a cryſtal with regard to its relative extent; it ſhows that there is no foundation for the opinion of a ſuppoſed balance between the particles of the ſalt and that of the ſolvent; and it ſhows alſo, that if the force of attraction be the efficient cauſe of the ſaline particles coming into contact, the force of gravitation acts at the ſame time, and modifies in a greater or leſs degree the effects of the firſt.

According to theſe obſervations, and the different ſtates in which cryſtallized ſubſtances are found, it has been ſuppoſed that we might conclude, that the force of adheſion between the particles of the ſalt and thoſe of the ſolvent, varies according to circumſtances, which depend on the degree of tendency to combination between the bodies, and the relative weight or bulk of the parts of which theſe bodies are compoſed. If a cryſtal in the incipient ſtage of its increaſe be placed on one of its baſes, it enlarges in the direction of its ſides; but if it be reverſed and placed on one of its ſides, it enlarges in the dimenſions of an elongated priſm.

An inſulated cryſtal, placed on one of its ſides on a ſmooth ſurface, and left undiſturbed to enlarge in ſize, preſents on this part a kind of hollow, which correſponds exactly with the ſide which it replaces. Here the ſaline particles which cannot reach this ſurface, are diſtributed on the neighbouring parts with which they come in contact, with this circumſtance, that the edges of the ſurface on which the cryſtal reſts increaſe in proportion, but without allowing the liquid to have acceſs to this ſurface.

The hollows which are formed at the ſurface of liquids differ ſometimes from each other even in the ſame ſalt. If we ſuppoſe that a particle forms the incipient point of the hollow, the latter will aſſume a configuration correſponding to the ſide of the particle preſented to the ſurface of the liquid: but the part which it touches increaſes alſo; and if by any circumſtance a change of poſition happens, the hollow, thus neceſſarily formed according to the arrangement of the part which correſponds exactly to the ſurface of the liquid, will change its form, becauſe the new poſition of the ſide preſented differs from the firſt.

When a neutral ſalt, in a ſtate of purity, and after being cryſtallized, ceaſes to produce any effect on vegetable blues, it is not ſuppoſed that any of its conſtituent principles is in exceſs. But if in this ſtate it is found to combine with other bodies, in ſuch a manner as to produce ſolid and well-defined cryſtals, we muſt admit that there exiſts an affinity between the ſalt and the body with which it has combined.

14
Compound combination.

This ſubject, Leblanc obſerves, of the ſupra-compoſition, or compound combination, as it might perhaps be called, of which ſeveral ſalts are ſuſceptible, has not hitherto much occupied the attention of chemical philoſophers. Some indeed have been pointed out by Bergman and others: but it has been remarked that theſe affinities are probably much more extenſive than has been ſuppoſed; and not only with regard to neutral ſalts with each other, but alſo neutral ſalts with other bodies. Of this kind of combination is not to be reckoned that of one of the conſtituent parts of a ſalt being in exceſs, which frequently takes place in ſome ſalts, and is found to be more or leſs permanent. This circumſtance ſeems to prove that certain ſalts have two different points in the combination of their conſtituent parts. Let us ſee what has been obſerved in this reſpect of the ſulphate of alumina, which will perhaps explain the reaſon that this ſalt is almoſt always found in nature in the acidulous ſtate. It is found that the more that alum approaches to the ſtate of ſaturation by an additional portion of baſe, the leſs ſolid the new combination becomes; and in all caſes, after a certain time, which is longer or ſhorter according to circumſtances, the portion which was added ſeparates. It will perhaps appear in the ſequel, that this tendency to combination which is conſtantly in action, producing an immenſe multitude of different individuals, reſides not only among the properties of the ſimple principles,

ciples, but alſo in thoſe which belong to all the compounds.

Many of the ſulphates are always found in the acidulous ſtate; and all of them ſeem to be ſuſceptible of combination with a new quantity of the ſame baſe, till they reach the point of ſaturation. For example, the ſulphate of copper, in the ſtate in which it is uſually found, cryſtallizes in eight-ſided, oblique priſms, terminated by ſides according to the obliquity of the priſm. But if another portion of baſe be added, the cryſtals aſſume the form of pyramids of ſeveral faces, ſeparated by a four-ſided priſm. The acidulous ſulphate of zinc gives cryſtals of ſix-ſided priſms, which are often very regular; but an addition of baſe produces a great change, for then the cryſtals are in the rhomboidal form, very little different from the cube. Alum in its ordinary ſtate of combination cryſtallizes in the form of a regular octaedron; but in the intermediate proportions between this ſtate and that of ſaturation, it aſſumes the form of a cube.

Hauy, as will be afterwards noticed, has demonſtrated that the form of the primitive molecules is the ſame in all cryſtals of the ſame ſalt, and he has ſhown by calculation that the variations ariſe from the laws of decrement in the layers which ſurround the nucleus; but that the order according to which the ſecondary forms are produced may be interrupted, whether this form be complete or not; and the cryſtal may then, according to circumſtances, return to its primitive form, or to ſome of thoſe which are derived from it. But from the experiments of Leblanc, he thinks that theſe changes always depend on new conditions in the ſtate of the fluid, as a different proportion of the principles of which the ſalt is compoſed.

15
Cryſtals modified by the ſolution.

If a cryſtal of octaedral alum be placed in a ſolution which forms cubic cryſtals of the ſame ſalt, the former will aſſume the cubic form, by giving up a ſeries of molecules from the ſummits of the ſolid angles, ſo that the layers continue to decreaſe on the triangular faces till the cryſtal has completed its new form. In this proceſs, the change may be ſtopped at any period, and cryſtals of every modification of form may be obtained. From this it follows, that the centre of each of the faces of the octaedron correſponds to a ſolid angle of the cube in which it is inſcribed. But if a cubical cryſtal be introduced into the ſolution which yields the octaedron, its return to this latter form proceeds in the ſame order, by the ſubtraction of a ſeries of molecules from the ſolid angles of the cube. It often happens, however, at the ſame time, that the ſubtraction of the molecules extends to the corners of the cryſtal; ſo that the layers of ſuper-poſition decreaſe all at once, according to the order of the formation of the octaedron, and the dodecaedron with rhomboidal ſurfaces. This circumſtance ſeems to ſuggeſt the poſſibility of obtaining cryſtals of alum of this latter form; but it ſeems to depend on a particular proportion which is not eaſily determined.

Thus we learn from experiment that ſalts which exhibit different forms of cryſtals can be made to aſſume each of theſe at pleaſure. This phenomenon, which has not been much attended to, ſeems to merit particular inveſtigation. The tranſition from one form to another may be explained according to the laws of diminution, by the ſucceſſive and regular ſubtraction of ſeries of molecules; ſo that the form actually obtained, the reſtoration of the preceding form, is eaſily explicable on the principle of reſtitution alone. It may be obſerved that during this kind of metamorphoſis, both operations, namely that by which the cryſtal receives on the one hand a new form, and that by which on the other hand it increaſes on all its ſides, conſtantly take place.

16
Cryſtals differently affected at different heights in the fluid.

The particles of a ſalt which are in ſolution in a fluid, are attracted by it, particle by particle, without any ſeparation or decompoſition; but it is neceſſary that there be a balance of the attracting forces between the ſalt and the ſolvent. This is demonſtrated by the following experiment. A veſſel two feet high and two inches in diameter was filled with a ſolution of a proper degree of concentration for the growth of cryſtals, which were ſuſpended at different heights from the bottom of the veſſel to the ſurface of the fluid; and it was obſerved that the increaſe of the cryſtal was in proportion to its depth in the veſſel, that which was neareſt the bottom increaſing moſt rapidly. When the liquid was deprived of ſaline particles by their accumulation on the cryſtals, by reſt, and ſometimes even by the influence of the atmoſphere, the cryſtals decreaſed by ſimilar gradations to thoſe of their increaſe; ſo that it at laſt reached that ſtate when the cryſtals near the ſurface of the liquid were diſſolved, while thoſe towards the bottom continued to increaſe; and ſometimes it happened that the cryſtals at the bottom of the veſſel continued to increaſe on the ſurface which was in contact with it, while the oppoſite upper ſurface was in a ſtate of diſſolution.

All the experiments which were made on ſalts of different degrees of ſpecific gravity accord with this obſervation; and the difference in the degrees of ſaturation of the waters of the ocean, which depends on the difference of depth, ſeems to be in favour of this opinion. It is confirmed by the analyſis of ſea-water by Bergman and others, which was taken up in different places and at different depths. It receives ſtill farther confirmation from a practice of the inhabitants of Salies in Bearn in eſtimating the degree of ſtrength of a ſalt ſpring. An egg is thrown into the waters of the ſpring, and the whole water which covers the ſurface of the egg is thrown away, as it is not of a ſufficient degree of concentration.

It is well known that a cold temperature is moſt convenient for the cryſtallization of ſalts. But it is not at the period when the ſalt begins to cryſtallize that it is moſt convenient to carry on the proceſs; for then it ſometimes happens, from too great concentration of the fluid, that the cryſtallization is too rapid and confuſed.

17
Two claſſes of ſaline ſubſtances.

Hitherto ſaline ſubſtances which are ſuſceptible of regular cryſtallization have been divided into two claſſes, according to the peculiarities in the formation of their cryſtals. The one claſs comprehends thoſe cryſtals which are formed by cooling the fluid in which the ſolution is made. The other claſs includes thoſe which are produced only during the evaporation of the ſolution. This diſtinction is no doubt well founded; but there are ſome exceptions to it which are neceſſary to be attended to in conducting the proceſs of cryſtallization. If a ſaline ſolution which is too much ſaturated, be cooled, it furniſhes a maſs of cryſtals which are confuſed and irregular, and which preſent no determined form except on thoſe ſides which are in contact with the liquid. If in this ſtate the remaining liquid is poured off, it will yield another ſet of cryſtals, but in very ſmall number; and there are ſome ſalts which continue to form cryſtals after being ſeveral times ſucceſſively treated in this way, the number of the cryſtals ſtill diminiſhing from the firſt degree of concentration. It will be found too that this will take place whether the proceſs be carried on in the open air or in cloſe veſſels. It follows from this that the increaſe or the formation of cryſtals, in this caſe, depends ſolely on the mutual attraction of the particles, or on the attraction between the particles and the cryſtal; an attraction or affinity which is not deſtroyed by the cooling of the fluid, but is probably regulated by the diſtance of the particles, and the degree of force or affinity which exiſts between the particles and the ſolvent. In ſome ſaline ſolutions the increaſe of the cryſtals goes on in this manner for a long time. It is only in the interval between the cooling of the liquid to the temperature of the atmoſphere, and that period when its degree of concentration is ſo diminiſhed that the increaſe of the cryſtals ceaſes, that the latter proceeds with that degree of perfection of which it is ſuſceptible.

18 Some ſaline ſolutions attract moiſture.

It is not a property peculiar to dry ſubſtances to abſorb moiſture from the atmoſphere. Liquids ſaturated with certain ſalts ſeem alſo to poſſeſs this property; for in ſome ſaline ſolutions, the liquids aſſume a ſolvent power which never fails to attack the cryſtals, and not only to prevent their increaſe, but to diminiſh the bulk which they had acquired. This accident can only be obviated by regulating the ſtate of the atmoſphere in which the evaporating veſſels are placed, and preſerving it free from an exceſs of moiſture. From cauſes which produce a contrary effect, the evaporation becomes too rapid; this circumſtance alſo requires to be attended to, and properly regulated, to enſure the full ſucceſs of the operation.

From the preceding obſervations it will appear, that ſolutions of ſalts which are ſuſceptible of cryſtallization have certain degrees of concentration which are neceſſary for the formation of cryſtals; and that they muſt be reduced nearly to that degree in which they begin to yield cryſtals, before it can be expected that they afford proper reſults. It is therefore neceſſary to attend particularly to the degree of concentration which each ſalt requires for the regular formation of its cryſtals, and to obtain them with that degree of tranſparency of which they are ſuſceptible. We have ſeen that in the formation of cryſtals they may be removed from one veſſel to another, and from one ſolution to another; and that in proportion to the ſlowneſs of the proceſs they become more beautiful and more perfect. Theſe operations, it may be added, require much patience and attention, but at the ſame time the obſerver is fully compenſated for his trouble, by perceiving the progreſs of the cryſtallization, and by the intereſt which is excited in all its ſtages.

It is eſſential to know that neither the cryſtals formed during the artificial evaporation, nor thoſe which are produced during the cooling of the ſolution, are proper to be made choice of for being increaſed and brought forward to the moſt perfect cryſtals. When a ſolution has become cold, that is to ſay, when it has acquired the temperature of the atmoſphere, and it is deprived of the exceſs of ſaline particles which it held in combination during its increaſe of temperature, it is ſtill in a condition to yield cryſtals, and as long as the diſtances between the particles are not too great to allow of mutual attraction. A ſolution ſaturated to exceſs affords on cooling a confuſed maſs of cryſtals; but after the fluid is poured off, it will ſtill produce more cryſtals, but in ſmaller number. The degree of concentration of the ſolution before it yielded the laſt product may be conſidered as the term of ſaturation moſt proper to be employed for the ſpecies of ſalt which is thus treated. But by the repetition of theſe operations, and the obſervation of their progreſs, it will not be difficult to diſcover the proper proportions between the ſalt and the ſolvent.

It ſeems to be a miſtake to ſuppoſe, with ſome, that the cryſtals which are placed in favourable circumſtances to become larger and more perfect, are injured by coming in contact with each other during their increaſe. It is undoubtedly better that they ſhould be kept ſeparate; but it does not appear that they are hurt by touching each other, if the number in the veſſel be not too great, and they are not heaped or preſſed together. In that cryſtallization which reſults from the cooling of a ſolution too much ſaturated, the cryſtals are always confuſed and interlaced with each other; and the molecules which are arranged in this kind of diſorder experience a kind of irregular diſtribution; and it may be obſerved, that in this caſe the ſummits only of the cryſtals which are elevated from the kind of cake which is formed on the ſurfaces of the veſſel containing the ſolution, preſent regular and determined forms. The maſs in which theſe cryſtals are implanted is a confuſed heap.

19 Cavities on cryſtals.

No cavities have been obſerved on the faces of cryſtals, excepting thoſe which are formed on the ſurface of fluids. Thoſe which are produced on that ſide of a cryſtal which reſts on the bottom of the veſſel are more common in other ſalts. This phenomenon ſeems to merit more attention than has yet been beſtowed upon it; as it explains eaſily the introduction of extraneous bodies which are ſometimes detected in the interior of cryſtals. For when a cavity of this kind has acquired a certain depth, it is capable of receiving part of any foreign ſubſtance, and to be filled up by the change of poſition of the ſame cryſtal, retaining at the ſame time the extraneous matter. By a little art and dexterity, theſe fortuitous circumſtances may be favoured, ſo that phenomena exhibited by ſuch occurrences may be traced and obſerved at the pleaſure of the operator. Experiments have been made with the view of aſcertaining whether an extraneous ſubſtance could be ſubſtituted as the nucleus of a cryſtal; but from the reſult of theſe experiments, it does not appear that the particles of any ſalt have a tendency to combine with any foreign matter, and to form regular cryſtals. The portions of the ſalt which were attached to the extraneous ſubſtance were always ſeparate and independent cryſtals.

There are ſome ſaline ſubſtances which retain in their ſolution an exceſs of particles even after cooling, and which being ſtrongly agitated inſtantly depoſit a great number of ſmall cryſtals which render the ſolution

tion turbid. The introduction of cryſtals of the ſame ſalt, it is well known, as in the caſe of a ſolution of Glauber's ſalt, promotes this ſudden cryſtallization or ſeparation of the exceſs of the ſalt. If, in this ſtate of the ſolution, cryſtals are immerſed with the view of having them large and regular, they are certain of being ſpoiled by the accumulation of a great number of ſmall cryſtals on their ſurface, unleſs the precaution of immediately waſhing them with pure water when this happens is obſerved.

It may be remarked alſo that when the ſolution is diminiſhed below a certain degree of ſaturation, the cryſtals not only ceaſe to increaſe, but are alſo again in ſome meaſure diſſolved; the corners and angles reduced and rounded. And if the cryſtals in this ſtate be introduced into a ſolution of ſufficient ſtrength to promote their increaſe, ſupernumerary faces and truncatures, as they are denominated in technical language, are formed on the rounded corners and angles. But theſe faces always diſappear as the increaſe of the cryſtals proceeds, and are replaced by corners and angles which become at laſt ſharp and diſtinct.

By attention to preſerve the ſolutions of ſalt in perfect purity, we ſhall be more certain of obtaining the moſt beautiful and tranſparent cryſtals. Some fluids, after a certain time, are obſerved to depoſit ſubſtances which are foreign to the ſalt held in ſolution, and were diſſolved along with it. Theſe ſubſtances ſometimes appear in the form of earthy matters, which precipitate to the bottom of the veſſel; in other caſes they are diffuſed in the form of flakes, and ſometimes they riſe and ſwim on the ſurface. In all theſe caſes, the cryſtals whoſe formation and increaſe are going forward muſt be removed, and the liquor muſt be filtrated before they are replaced.

20
Variations in cryſtals from changes in the ſolution.

A ſaline ſubſtance, which is capable of cryſtallization, poſſeſſes, in the ſtate of minute diviſion in which it is in ſolution, or in the condition of the molecules which compoſe it, a determined property which is uniform and conſtant, in which reſides eſſentially the power of uniting in a certain ſymmetrical manner, and thus conſtructing regular ſolids. The reſults alſo are uniform and conſtant when the proceſs is carefully conducted; but it is neceſſary to diſtinguiſh with accuracy the circumſtances which accompany the operation, and may occaſion a deviation from this uniformity. The ſulphate of iron, for inſtance, uſually cryſtallizes in the form of rhomboids; but ſometimes it has been found to aſſume that of an irregular octaedron. And although it may be true that an elongated octaedron may be claſſed with priſmatic cryſtals, it does not on that account belong leſs to the octaedral form; but it ſeems probable that theſe different varieties, in the forms of cryſtals, depend on ſome changes which take place in the ſolutions themſelves. The iron in the preſent caſe is conſtantly receiving new portions of oxygen from the atmoſphere, and in this new combination it is precipitated in the fluid: this, therefore, occaſions a change in the conſtituents of the ſalt.

Several ſulphates are found to combine readily with each other: thoſe of iron and copper are of this deſcription; and the reſult of this compound cryſtal is always a rhomboid. It ſeems to be doubtful whether this ſhould be conſidered as a caſe of ſimple interpoſition of one ſalt with the other.

21
Formation of dendrites

When a liquid, which holds ſaline bodies in ſolution, is evaporated to a certain degree, a cruſt forms on the ſurface, acquires a certain thickneſs, and when this is removed, it is renewed. The point at which the liquid exhibits this appearance is known in chemiſtry, by the appellation of *evaporation to a pellicle.* When it has reached this point, the ſolution is in a ſtate of complete ſaturation; and the ſmalleſt additional quantity of fluid cannot be withdrawn without a correſponding quantity of ſalt aſſuming the ſolid form. On this principle Robinet has attempted to account for the formation of *dendrites*, or the arboreſcent appearance and effloreſcence of ſome ſalts. Almoſt all the different ſpecies of fucus or ſea-weed, he obſerves, are covered, in drying, with an effloreſcence of white matter. In ſome ſpecies, this white matter was obſerved to poſſeſs a ſaccharine quality. A number of large roots of the *fucus palmatus* was hung up in the ſhade, and ten days had elapſed without the appearance of any thing on the ſurface. After that period it became white, and it was ſoon covered with a light downy ſubſtance, the filaments of which gradually increaſed to a conſiderable length. When this downy matter was bruſhed off with a feather, it was renewed till the plants were completely dry. This ſubſtance, it appeared on examination, was of a ſaccharine nature, mixed with a ſmall portion of common ſalt, and a great quantity of mucilaginous matter. By ſolution and cryſtallization the ſugar was ſeparated from the other ſubſtances.

In comparing the circumſtances of this effloreſcence with thoſe of the formation of the pellicle, in the progreſs of evaporation, the former ſeems to be a modification of the latter. In a veſſel which contains a liquid ſaturated with a ſalt, the ſurface ſubjected to evaporation has no ſooner aſſumed a ſolid form, than the ſurface immediately inferior is expoſed to the action of the ſame cauſes, and produces the ſame effect; and this effect continues till this cruſt has become ſo thick, or ſo compact, as to prevent the contact of air, and then the evaporation ceaſes. But, on the contrary, in the fucus, the air acting only on the ſurface of the plant, the liquid which it contains cannot undergo the proceſs of evaporation, without coming to the ſurface. The attraction of the matter of the plant tends to promote this motion; for as the liquid is equally diffuſed through its whole maſs, it riſes conſtantly to the ſurface, in proportion as this ſurface is dried by the ſurrounding air; and it would appear that this is the proceſs in the deſiccation of all thick and maſſy bodies. Now, the ſaline matter which, in the preſent caſe, is in the ſtate of effloreſcence, having the ſame power of attraction on the liquid, the rudiments of each filament conſtitute, at the inſtant of their formation, part of the whole maſs or body of the plant. They participate, therefore, of the ſame degree of moiſture as that of the plant, and it is on their ſurface that the evaporation and cryſtallization of ſaline matter chiefly take place.

The mechaniſm of the dendritical or arboreſcent form of ſaline bodies ſeems to be in this way capable of explanation. The whole ſaline maſs, which extends to the edges of the veſſel, and even redeſcends externally, is conſtantly in the humid ſtate, as long as any liquid remains in the veſſel. It may be ſuppoſed, that the matter of the ſides of the veſſel determines, by its attraction, the external circle of the ſurface of the liquid to riſe above the ſurface; a phenomenon which is ſufficiently obvious, but eſpecially in narrow veſſels. This portion of liquid, which is more completely ſubjected to evaporation, gives origin to a circle of ſaline matter, which appears thus raiſed above the ſurface of the liquid, and which, being the firſt rudiments of the dendrites, contributes afterwards to its increaſe, in the way which has been already explained. Thus the vegetation of ſalts bears a ſtriking reſemblance to the proceſs of effloreſcence, or the formation of the downy matter on the ſurface of the fucus.

22 Effloreſcence.

There is yet another kind of cryſtallization which ſeems to depend on the ſame cauſe. This is the ſaline effloreſcence, which occurs in different places on the ſurface of the globe, and is frequently in ſuch quantity as to become an important object of manufacture. Without extending our obſervations to the effloreſcence of ſoda on the ſurface of the ſoil in Egypt, or that of nitre in Aſiatic countries, we may refer to the production of muriate of ſoda, or common ſalt, in different parts of Europe, in thoſe places which are covered with the waters of the ocean during high tides. The waters of the ſea with which the ſandy ſhores are twice periodically moiſtened in the courſe of the month, are far diſtant from the point of ſaturation which determines cryſtallization. They rarely contain more than 3 parts of ſalt in 100; and the ſand at the degree of moiſture in which it is left by the ſea, is not impregnated with a ſufficient quantity of ſaline matter to be worthy the labour of manufacturing; but, during the interval between the tides, theſe circumſtances are greatly changed. The dry air of ſummer, by evaporating the moiſture on the ſurface, allows the matter of the ſand to attract towards the ſurface a ſimilar portion of water, which was in the lower part of the ſoil, and which always tends to diffuſe itſelf equally through the whole maſs. This liquid, carrying with it the ſalt which it holds in ſolution, increaſes the quantity of ſaline matter which exiſts on the ſurface. This proceſs continues without interruption, as long as there is no fall of rain. It reaches at laſt a certain point, at which the water ſubjected to evaporation is ſaturated with the ſalt; and this proceſs cannot proceed farther without the depoſition of cryſtals of the ſalt, which diſcover themſelves by their ſhining appearance. After ſome days, the ſand on the ſurface is collected, and about ſix times the quantity of ſaline matter is found in the ſame proportion of ſand, when it was firſt moiſtened by the ſea water (A).

23 Cruſt on the bottom of veſſels.

Another phenomenon which takes place during the proceſs of artificial evaporation, ſhould not paſs unnoticed. This is the formation of a ſaline cruſt at the bottom of the veſſels in which the proceſs is conducted. This ſeems to be the immediate effect of ebullition; for when the temperature of the liquid is kept under the boiling point, no ſuch effect is produced. This cruſt is compoſed of all the ſaline ſubſtances which are held in ſolution in the liquid; and even theſe ſubſtances are found combined in the ſame proportion in which they actually exiſt in the ſolution. Whatever be the attraction of theſe ſubſtances for water, or even if they poſſeſs a deliqueſcent property, they are not leſs diſpoſed to enter into combination during the formation of the ſolid cruſt on the bottom of veſſels in which the proceſs of evaporation is conducted with a temperature equal to the boiling point. A ſlight degree of attention will ſatisfy us, that the formation of this cruſt depends on the particular circumſtances of the evaporation in the caſe of ebullition. It muſt be obvious, that in this caſe the ſtratum of liquid which is in immediate contact with the veſſel, receives the caloric which penetrates its ſides is charged with it beyond its capacity, changes its ſtate, and aſſumes the gaſeous form, and by this change having entirely loſt its ſolvent power, whatever ſaline matter is held in ſolution muſt aſſume the ſolid ſtate in contact with the ſides of the veſſel, and conſequently adhere to it. Thus it happens, according to a very judicious obſervation, that in different ſaline ſolutions, the reſults of which have been compared, theſe ſcales or cruſts are more abundant in proportion as the degree of ſaturation is leſs *.

24 Microſcopical cryſtals.

To theſe obſervations we ſhall only add a ſhort account of the phenomena of cryſtallization, as they were obſerved, with the aſſiſtance of a microſcope, by Mr Baker, and of the appearances of different ſaline bodies which he has deſcribed. This will not afford any ſcientific information to the philoſopher, but it may perhaps be the ſource of amuſement to ſome of our readers, and the means, by a minute obſervation of the phenomena, of leading to ſome uſeful diſcoveries. The method which he followed in conducting theſe experiments, is the following. The ſubſtance to be examined is to be diſſolved in a quantity of pure water, ſo as to be completely ſaturated. For ſalts of eaſy ſolubility, cold water may be employed; but for ſalts which are diſſolved with more difficulty, hot or boiling water may be found neceſſary. In preparing the ſolution, the ſame rule may be obſerved as in preparing ſolutions for obtaining large cryſtals, which has been given in the former part of this ſection. The ſolution ſhould be allowed to remain at reſt for ſome hours, ſo that the firſt cryſtallization, if too much ſaline matter has been added to the liquid, may be allowed to take place. Thus the ſolution will be always of the ſame ſtrength, and the ſame appearances may be uniformly expected.

When the ſolution is thus prepared, a drop of it may be taken up with the point of a quill, cut in the form of a pen, and placed on a flat ſlip of glaſs, ſpreading it on the glaſs with the quill till the liquid is ſo ſhallow as to riſe very little above its ſurface. It is then

* *Jour de Phyſ.* lviii. 124.

(A) Common ſalt is manufactured in this way on the ſandy ſhores of the Solway Frith, in Annandale in Scotland. Theſe flat ſhores are covered with the waters of the ocean during ſpring tides; and in the interval of theſe tides the evaporation by the heat of the ſun and the action of the air is ſo conſiderable, as to leave the ſand impregnated with a quantity of ſalt, ſufficient to defray the expence and trouble of manufacturing it by filtration and boiling.

then to be held over the clear part of a moderate fire, or the flame of a candle, and ſuch a degree of heat applied as is found from experience to produce the neceſſary evaporation. This will be known by obſerving the formation of ſaline particles at the edges of the drop of fluid. The microſcope being previouſly adjuſted, and a magnifier of a moderate power being fitted on, the ſlip of glaſs is to be placed immediately under the eye, and brought exactly to the focus of the magnifier. After running over the whole drop, the attention is to be directed to that ſide on which the proceſs of cryſtallization firſt commences, and proceeds from the circumference towards the centre. The motion is at firſt ſlow, if too much heat has not been applied, but becomes quicker as the evaporation continues. In ſome cryſtallizations the configurations are produced towards the end of the proceſs with great rapidity, and exhibit an elegance, order, and regularity, which imagination only can conceive. When this rapid action has once begun, the eye muſt be kept fixed on the object, till the whole proceſs is completed, becauſe new forms appear, quite different from thoſe which were firſt produced, and which have been properly aſcribed to a quantity of different ſalts mixed with the ſubſtance to be examined, when the precaution has not been uſed of having it in a ſtate of purity. When the configurations are fully formed, and the water evaporated, ſuch ſalts as are deliqueſcent, it is ſcarcely neceſſary to obſerve, are ſoon deſtroyed by attracting the moiſture from the air; but thoſe which are more permanent, and not diſpoſed either to deliqueſce or to be deprived of their water of cryſtallization, may be preſerved, by being encloſed between glaſſes, for a long time, as amuſing objects for the microſcope. To make the liquid ſpread readily on the glaſs, the ſurface of it may be moiſtened with a little of it, and rubbed with the finger. In this way, the repulſion which ſometimes is obſerved between the liquid and the glaſs is completely removed. During the evaporation, the object-glaſs of the microſcope is ſometimes obſcured by the condenſation of the water from the ſaline ſolution on the ſlip of glaſs, and the viſion is thus rendered indiſtinct. When this happens, if the circumſtance be recollected, the glaſs muſt be wiped and replaced. In examinations of ſaline ſolutions, and in obſerving the progreſs of cryſtallization, Mr Baker recommends the light of a candle in preference to the light of day, which latter being of a whiter colour and nearly the ſame with the tranſparent cryſtals, they are leſs diſtinctly ſeen than with the brown light of a candle.

Plate CLXV.

Fig. 1. is a repreſentation of the microſcopical cryſtals of *nitre* or *ſaltpetre*. They begin to ſhoot out from the edges with very moderate heat into flat figures of different lengths, with ſtraight parallel ſides, and exceedingly tranſparent. They appear in different ſtates of their progreſs at the letters, *a*, *b*, *c*, *d*, and *e*; *a* exhibits the appearance when they firſt begin to form. When a number of cryſtals have made their appearance they ſometimes diſſolve under the eye, and diſappear entirely; but, by continuing to watch the changes which go on, the proceſs is frequently obſerved to recommence, and new ſhoots puſh out. The firſt cryſtals ſometimes become larger without undergoing any change of figure; and ſometimes form in the way which is repreſented in the figure. When the heat is too great, as might be expected, the proceſs goes on with great rapidity, and numerous ramifications are formed. This ariſes no doubt from the confuſed cryſtallization.

Fig. 2. ſhews the microſcopical cryſtals of *blue vitriol* (ſulphate of copper), which appear firſt round the edges, ſhort at the beginning, but gradually increaſing, as they are repreſented at the letters *a*, *b*, *c*, which denote their difference of form, and the progreſs of their growth. Theſe cryſtals, which are tranſparent, aſſume a ſolid regular form, and reflect the light from their poliſhed ſides and angles. As the evaporation proceeds, a great number of filaments as fine as hairs make their appearance, ſome croſſing each other, as at *d*; and others exhibiting a ſtellated form with many radiations, as at *e e*. The cryſtallization of this ſalt proceeds ſlowly. Towards the end of the proceſs the regular cryſtals appear, and are finely branched as at *f*.

Fig. 3. is a view of the cryſtals of diſtilled verdigriſe, or acetate of copper. When it is immediately applied to the microſcope, the regular figures 1, 2, 3, 4, 5, 6, 7, make their appearance; but if the ſolution is allowed to remain at reſt for a few hours, and a drop of it is then heated on a ſlip of glaſs till it begins to concrete about the ſides, ſharp-pointed ſolid figures are formed, and ſhoot forwards. Theſe cryſtals are often ſtriated obliquely, frequently ariſe in cluſters, or ſhoot from a centre. Sometimes, towards the end of the proceſs, and in the middle of the drop, they aſſume a foliated form, and have the appearance of four leaves of fern united by their ſtems.

Fig. 4. ſhews the microſcopical cryſtals of alum. Theſe are more or leſs perfect according to the ſtrength of the ſolution, and the temperature employed. To prepare this ſalt for examination, the ſaturated ſolution may remain for ſome days. In that time cryſtals will form, and if what remains liquid ſhould be found too weak, heat may be applied, which will again diſſolve the cryſtals.

In fig. 5. is a view of the cryſtals of borax, or the ſubborate of ſoda. The drop of this ſolution ſhould not be held too long over the fire, as it hardens on the ſlip of glaſs, and no cryſtals appear. A briſk heat for about a ſecond is recommended as the beſt method. It is then applied to the microſcope, and the cryſtals will form as in the figure.

Fig. 6. ſhews the microſcopical cryſtals of ſal ammoniac, or muriate of ammonia. Great numbers of thick, ſharp, and broad ſpiculæ ſhoot from the edges, and from their ſides are protruded others of the ſame form, which are parallel to each other, but perpendicular to the main ſtem. The formation of theſe cryſtals, unleſs the heat employed be very moderate, is very rapid.

Fig. 7. exhibits the appearance of the cryſtals of acetate of lead (ſugar of lead). After a little of this ſalt is diſſolved in hot water, and allowed to remain at reſt for a ſhort time, it is fit for being examined with the microſcope. A drop of it put on a ſlip of glaſs, and heat being applied, will be ſeen forming round the edge, a regular border of a clear and tranſparent ſubſtance, which with a ſtrong heat runs over the whole of the drop, and hardens on the glaſs; but when the heat employed is moderate, bundles of lines, arranged

ranged in a radiated form, make their appearance. They ariſe from points in the interior edge of the border, and ſpread out nearly at equal diſtances from each other, in all directions.

In fig. 8. are repreſented the cryſtals of Glauber's ſalt (ſulphate of ſoda), which aſſumes the form of ramifications, proceeding from the ſide of the drop, like the growth of minute plants. Other appearances preſent themſelves in different periods of the proceſs. It is indeed but of ſhort duration, for when the cryſtallization has once begun, it goes on with great rapidity.

The examples which we have now given will, we apprehend, be ſufficient to enable thoſe who are curious in microſcopical obſervations, to proſecute reſearches of this kind. Many more might have been given from the ſame author; but as experiments on cryſtallization, conducted in this way, are little ſuſceptible of accuracy or preciſion, we wiſh to avoid ſwelling out the article without conveying ſome uſeful information. Our chemical readers will readily perceive, that very different appearances will be the reſult of a ſlower or more rapid cryſtallization, greater or leſs purity of the ſalt, and different degrees of ſtrength of the ſolution. In compound bodies, for inſtance, modifications in the form of the cryſtals are produced by a difference in the proportion of the conſtituent parts. The cryſtals of alum, which is a triple ſalt, viz. a ſulphate of alumina and potaſh, are in the form of octahedrons. The addition of a quantity of alumina changes the form of the cryſtals to that of cubes; and if a cubic cryſtal of alum be introduced into a ſolution, the proportions of which afford octahedral cryſtals, the cubic cryſtal will aſſume the form of an octahedron, and the octahedral cryſtal put into a ſolution which affords cubic cryſtals, paſſes into that of the cube. The nature of the ſolvent alſo, in which the cryſtallization takes place, produces certain deviations in the form of the cryſtals. The ſolution of common ſalt in water affords cubical cryſtals, but in urine it cryſtallizes in the form of octahedrons. Muriate of ammonia diſſolved in water, cryſtallizes in the form of an octahedron, but in urine it affords cryſtals in the form of cubes. But we now proceed to conſider the theory of the ſtructure of cryſtals, which will be the ſubject of the next ſection.

Sect. II. *Of the Theory of the Structure of Cryſtals.*

In the former ſection we have given a view of the phenomena of cryſtallization. The regular forms which bodies aſſume by means of this proceſs, have occupied no ſmall ſhare of the attention of naturaliſts and chemical philoſophers. The reſearches and inveſtigations of Bergman, Romé de L'Iſle, and Hauy, have been particularly directed this way. Bergman, in his 12th Diſſertation *, treats of the variety of the forms of cryſtals, of the various figures derived from the ſpathaceous form, of the ſtructure of the moſt minute parts, and of the different modes in which cryſtals are generated. Romé de L'Iſle has arranged cryſtals into ſix ſpecies, derived from the varieties of form. 1. Tetrahedron. 2. Cube. 3. Octahedron. 4. Parallelopiped. 5. Rhomboidal octahedron. 6. Dodecahedron. But the ingenious reſearches of Hauy on this ſubject have been followed by the completeſt and moſt ſucceſsful inveſtigation of the theory of the ſtructure of cryſtals which has yet appeared. Of this theory, an account of which the reader will find in the *Annales de Chimie* †, and in his *Traité de Mineralogie* ‡, we now propoſe to give a comprehenſive view.

* Phyſic. & Chemic. Eſſays.
† Vol. xvii.
‡ Vol. i.

This theory, the author obſerves, cannot be fully underſtood without the aid of analytical calculations. For beſide the convenience of analyſis, including in the ſame formula a great number of different problems, it is by means of it alone, that the theory can aſſume the character of abſolute certainty in arriving at the ſame reſults which are obtained by obſervation. But notwithſtanding theſe conſiderations, it ſeemed to be better for thoſe who had not a competent knowledge of the ſcience of calculation to prefer the method of ſimple reaſoning, but accompanied with geometrical figures, which are ſo uſeful in giving a diſtinct conception of the arrangement of the ſmall ſolids which combine together to form a cryſtal. This arrangement is denominated *ſtructure*, in oppoſition to the term *organization*, which expreſſes the more complicated mechaniſm of vegetables and animals. This method may perhaps be leſs direct, and leſs preciſe and expeditious, and it may require attention to thoſe details which are paſſed over in the analytical method to reach its object more ſpeedily; it has, however, this advantage, that the mind by its means perceives better the connexion of the different parts under conſideration, and can more eaſily comprehend the facts with which it is furniſhed.

I. Mechanical Division of Crystals.

The ſame mineral ſubſtance, it is known, is ſuſceptible of ſeveral different forms, well defined, ſome of which do not appear, at firſt ſight, to have any common point of reſemblance to indicate their relation. If, for inſtance, we compare the regular hexahedral priſm of calcareous ſpar with the rhomboid of the ſame mineral (b), whoſe large angle is about 101½°

(b) The name of *rhomboid* is given by the author to a parallelopiped *a*, *e* (fig. 12.) terminated by ſix equal and ſimilar rhombuſes. In every rhomboid, two of the ſolid angles, ſuch as *a*, *e* oppoſed to each other, are formed by the junction of three equal plane angles; each of the ſix ſolid angles is formed by a plane angle equal to each of the three preceding, and by two other angles of a different meaſure, but equal to each other. The points *a e* are the ſummits, the line *a e* is the axis. In any one of the rhombuſes *a b*, *d f*, which compoſe the ſurface, the angle *a* contiguous to the ſummit, is called the ſuperior angle; the angle *d* the inferior angle; and the angles *b* and *f* are the lateral angles. The ſides *a b*, *a f* are the ſuperior edges, and the ſides *b d*, *d f* the inferior edges: *b f* is the horizontal diagonal, and *a d*, the oblique diagonal. The rhomboid is obtuſe or acute, according as the angles of the ſummits are obtuſe or acute. The cube is the limit of the rhomboids.

we ſhould be led to believe that each of theſe two forms is quite diſtinct from the other. But this point of relation, which eſcapes notice, when we conſider only the external form, becomes ſenſible when we attend to the intimate mechaniſm of the ſtructure. Here the author gives a hiſtorical view of the progreſs of his reſearches, and traces the ſteps which led him to the diſcovery of what became as it were the key of his whole theory.

He had in his hand a hexahedral priſm of calcareous ſpar, ſimilar to that mentioned above, and which had been detached from a group of the ſame cryſtals. The fracture preſented a very ſmooth ſurface, ſituated obliquely, like the trapezium *pſut* (fig. 9.), and which had an angle of 135°, both with the remainder *abcsph* of the baſe, and with the remainder *tuef* of the plane *inef*. Obſerving that the cuneiform ſegment *psutin* which this fracture ſeparated from the cryſtal, had for its vertex one of the edges of the baſe, namely the edge *in*, he attempted to ſeparate a ſecond ſegment in that part to which the contiguous edge *cn* belonged. For this purpoſe he employed the blade of a knife, directed with the ſame degree of obliquity as the trapezium *pſut* and aided by the ſtroke of a hammer. This attempt failed; but having tried the ſame operation towards the next edge *bc*, a new trapezium ſimilar to the firſt came into view. The fourth edge *ab* reſiſted the inſtrument, but the following, *ah*, readily yielded to mechanical diviſion, and preſented a third trapezium, having as fine a poliſh as the other two. The ſixth edge *ih*, it is ſcarcely neceſſary to obſerve, could not be divided, more than the fourth and the ſecond.

Proceeding then to the inferior baſe *defgkr*, it was ſoon found that the edges of this baſe, which admitted of diviſions ſimilar to the preceding, were not the edges *ef*, *dr*, *gk*, which correſponded to thoſe which could be divided towards the upper part, but the intermediate edges *de*, *vy*, *gf*. The trapezium *lqyv* ſhews the ſection made below the edge *kr*. This ſection is obviouſly parallel to that of the trapezium *pſut* and the four other ſections are in like manner parallel, two and two. Now, theſe different ſections being in the direction of the natural joints of the laminæ, it was eaſy to obtain others parallel to each of them, but it was found impoſſible to divide the cryſtal in any other direction. Following this mechanical diviſion according to the paralleliſm ſtated above, new ſections were obtained, always nearer to the axis of the priſm; and when the ſections were carried ſo far as to make the remainder of the two baſes diſappear, the priſm was transformed into a ſolid OX (fig. 10.) terminated by 12 pentagons, parallel two to two, of which thoſe of the extremities, namely, SAOIR, GIODE, BAODC, on the one ſide, and KNPQF, MNPXU, ZQPXY on the other, were the reſults of the mechanical diviſion, and had their common vertices O, P, ſituated in the centres of the baſes of the priſm, fig. 9. The ſix lateral pentagons RSUXY, ZYRIG, &c. (fig. 10.) were the remainders of the planes of the ſame priſm.

In proportion as the ſections were multiplied, always parallel to the preceding, the lateral pentagons diminiſhed in height, and at a certain term the points R, G being confounded with the points Y, Z, the points S, R with the points U, Y, &c. there remained no more of theſe pentagons, but the triangles YIZ, UXY, &c. (fig. 11.). Beyond that term the ſections coming to paſs over the ſurface of theſe triangles, diminiſhed gradually in extent, till at laſt the ſame triangles were loſt, and then the ſolid obtained from the hexahedral priſm, appeared to be a rhomboid *ae* (fig. 12.) exactly ſimilar to that which is commonly denominated *Iceland ſpar*.

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So unexpected a reſult led the ingenious author to the examination of other calcareous cryſtals in a ſimilar manner, all of which yielded to mechanical diviſion in ſuch a way, as, when all the external ſurfaces had diſappeared, the nucleus which remained was always a rhomboid, of the ſame form as the firſt. All that was neceſſary was to diſcover the direction of the ſections which conducted to the central rhomboid.

To extract, for inſtance, this rhomboid from the ſpar which is uſually denominated *lenticular*, and which is itſelf a much more obtuſe rhomboid, having its large plane angle equal to 114° 18′ 56″, it was neceſſary to begin with the two vertices, and to make the ſections paſs through the ſmall diagonals of the faces. But if it is wiſhed, on the contrary, to get at the nucleus of the rhomboidal ſpar with acute vertices, the direction of the ſections of the planes muſt be parallel to the edges contiguous to the ſummits, and in ſuch a manner that each of them ſhall be equally inclined to the faces which it cuts.

Theſe reſults are the more worthy of attention, as it would ſeem at firſt, that in the proceſs of cryſtallization, after the rhomboid has been once adopted with regard to a determined ſpecies of mineral, it ought always to re-produce it with the ſame angles. But the paradox which ariſes from this diverſity of appearance, is explained by the double uſe of the rhomboidal form, which ſerves here to diſguiſe itſelf, and conceals fixed and conſtant characters under a variable external appearance.

If we take a cryſtal of a different nature, ſuch as a cube of *fluor ſpar*, the nucleus will have a different form. This will be, in the preſent caſe, an octahedron, which we ſhall obtain by taking off the right ſolid angles of the cube. Heavy ſpar will produce for a nucleus a right priſm with rhomboidal baſes; feld ſpar, an oblique-angled parallelopiped, but not rhomboidal; apatite or beryl, a right ſix-ſided priſm; the adamantine ſpar a rhomboid, a little acute; blende, a dodecahedron, with rhomboidal planes; iron of the iſland of Elba, a cube, &c.; and each of theſe forms will be conſtant in relation to the whole ſpecies, ſo that its angles will undergo no variation which is appreciable: and if we attempt to divide the cryſtal in any other direction, we ſhall not be able to find any joint; we ſhall only obtain indeterminate fragments; it will rather be broken than divided.

Theſe ſolids inſcribed each in all the cryſtals of the ſame ſpecies, ought to be regarded as the true primitive forms on which all the other forms depend. All minerals, it is true, are not ſuſceptible of mechanical diviſion, but the number is greater than what appeared at firſt ſight; and with regard to thoſe cryſtals in which the attempts to diſcover the natural joints have failed, it has been remarked that their ſurface ſtriated in a certain direction, or the relation of their different forms, among thoſe which belong to the ſame ſubſtance, frequently preſented indications of their ſtructure, and by reaſoning from their analogy with other diviſible cryſtals, we may determine this ſtructure, at leaſt with a good deal of probability.

All deviations from the primitive form are called by Hauy, *ſecondary forms*. The number of theſe forms has certain limits, which can be determined by theory, according to the laws which regulate the ſtructure of cryſtals.

The ſolid of the primitive form, which is obtained by means of the operation deſcribed above, may be farther ſubdivided in a direction parallel to its different faces. All the ſurrounding matter is equally diviſible by ſections parallel to the faces of the primitive form. Hence it follows, that the parts detached by the aid of all theſe ſections are ſimilar, and only differ in their volume, which continually decreaſes in proportion to the extent of the diviſion. Thoſe, however, muſt be excepted, which are near to the faces of the ſecondary ſolid; for theſe faces not being parallel to thoſe of the primitive form, the fragments which have one of their facets taken in the ſame faces, cannot exactly reſemble thoſe which are detached towards the middle of the cryſtal. For inſtance, the fragments of the hexahedral priſm (fig. 9.), whoſe external facets make part of the baſes, or of the planes, have not, in this reſpect, the ſame figure with thoſe which are ſituated nearer to the center, all of whoſe facets are parallel to the ſections *pſut*, *lqyv*; but the difficulty which preſents itſelf at firſt ſight, in conſequence of that diverſity, is removed by the help of the theory, and the whole are reduced to a unity of form.

But the diviſion of the cryſtal into ſmall, ſimilar ſolids, has a certain limit, beyond which we ſhould arrive at particles ſo ſmall, that they are no longer diviſible, without deſtroying the nature of the ſubſtance, or decompoſing it. At this term, the inveſtigation ſtops; and to theſe ſmall ſolids, which we might inſulate if our organs and inſtruments were ſufficiently delicate, Hauy has given the name of *integrant* or *integral molecules*. He thinks it probable, that theſe molecules are thoſe which were ſuſpended in the fluid in which the cryſtallization took place. In general it may be obſerved that with the aid of theſe molecules, the theory reduces to ſimple laws the different forms of cryſtals, and arrives at reſults which exactly repreſent thoſe of nature.

When the nucleus is a parallelopiped, that is, a ſolid having ſix parallel faces, two to two, like the cube, the rhomboid, &c. and this ſolid admits of no other diviſions than thoſe which are made in the direction of its faces; it is obvious that the molecules which reſult from the ſubdiviſion, whether of the nucleus, or of the ſurrounding matter, are ſimilar to this nucleus. In other caſes, the form of the molecules is different from that of the nucleus. There are, beſides, other cryſtals which afford, by means of mechanical diviſion, particles of different figures combined together through the whole extent of theſe cryſtals. The ingenious author of the theory has thrown out ſome conjectures on the manner of reſolving the difficulty which theſe kinds of mixed ſtructures preſent; and at any rate he obſerves that it does not affect the ſtability of the theory.

II. Laws of Decrement.

1. Decrements at the Edges.

The primitive form, and that of the integrant molecules, being determined, after the diſſection of the cryſtals, we muſt inveſtigate the laws according to which theſe molecules were combined, to produce around the primitive form thoſe kinds of coverings which terminated ſo regularly, and from which reſulted polyhedra ſo different from each other, although originally of the ſame ſubſtance. Now, ſuch is the mechaniſm of the ſtructure ſubject to theſe laws, that all the parts of the ſecondary cryſtal ſuperadded to the nucleus, are formed of laminæ, which decreaſe regularly by ſubtractions of one or more ranges of integral molecules, ſo that theory determines the number of theſe rows, and by a neceſſary conſequence the exact form of the ſecondary cryſtal.

To have a diſtinct idea of theſe laws, let us take a very ſimple and elementary example. Conceive EP (fig. 13.) to repreſent a dodecahedron whoſe faces are equal and ſimilar rhombuſes, and that this dodecahedron is a ſecondary form, having a cube for its nucleus or primitive form. By the inſpection of fig. 14. the poſition of this cube in the cryſtal may be eaſily conceived. The ſmall diagonals DC, CG, GF, FD of the four faces of the dodecahedron, being united round the ſame ſolid angle, form a ſquare CDFG. Now there are ſix ſolid angles, compoſed of the four planes, namely the angles L, O, E, N, R, P (fig. 13.), and conſequently, if ſections are made to paſs through the ſmall diagonals of the faces which compoſe the ſolid angles, ſix ſquares will be ſucceſſively uncovered. Theſe ſquares will be the faces of the primitive cube, of which three are repreſented at fig. 14. namely CDFG, ABCD, BCGH.

This cube would evidently be an aſſemblage of cubic integral molecules, and it would be neceſſary that each of the pyramids, ſuch as LDCGF (fig. 14.), which reſt on the faces ſhould be itſelf compoſed of cubes equal to each other, and to thoſe which form the nucleus. To have a more diſtinct conception of this arrangement, let us compoſe an artificial dodecahedron of a certain number of ſmall cubes, the arrangement of which will be an imitation of the proceſs of nature in diſpoſing the molecules in the formation of the dodecahedron.

Let ABGF (fig. 15.) be a cube compoſed of 729 ſmall cubes equal to each other, in which caſe each face of the whole cube will include 81 ſquares, that is, 9 on each ſide, which will be the external faces of as many partial cubes repreſenting the molecules. This cube will be the nucleus of the dodecahedron which is to be conſtructed. On one of the faces, as ABCD, of the cube apply a ſquare lamina, compoſed of cubes equal to thoſe which form the nucleus, but having towards each a row of cubes leſs than if it were on a level with the contiguous faces BCGH, DCGF, &c. This lamina will be compoſed of 49 cubes, that is, 7 on each ſide, ſo that if the inferior baſe be *onfg* (fig. 16.) this baſe will fall exactly on the ſquare marked with the ſame letters in fig. 15. Above this firſt lamina let a ſecond be applied, compoſed of 25 cubes, 5 on each ſide, ſo that if *lmpu* (fig. 17.) repreſent its inferior baſe, this baſe will correſpond exactly with the ſquare marked with the ſame letters in fig. 15. If in like manner a third lamina be applied to the ſecond, which is compoſed only of 9 cubes, that is, 3 on each ſide, ſo that $v\,x\,y\,z$ (fig. 18.) being the inferior baſe, ſhall correſpond with the ſquare marked with the ſame letters in fig. 15.; and if on the middle ſquare *r* of the preceding lamina the ſmall cube *r* (fig. 19.) be placed, this will repreſent the laſt lamina.

When this operation is completed, it will appear that there is formed on the face ABCD (fig. 15.) a four-ſided pyramid, of which this face is the baſe, and the cube *r* (fig. 19.) is the ſummit. And if the ſame operation be continued on the other five ſides of the cube, we ſhall have ſix four-ſided pyramids, reſting on the ſix faces of the nucleus, which is enveloped with them on all ſides. But as the different rows of laminæ compoſing theſe pyramids project beyond each other for a certain way, as appears on fig. 20. where the parts raiſed above the planes BCD, BCG repreſent the two pyramids which reſt on the faces ABCD, BCGH (fig. 15.), the faces of the pyramids will not form continued planes; for they will be alternately re-entering and ſalient, in ſome meaſure imitating a ſtair with four ſides.

Let us now ſuppoſe that the nucleus is compoſed of a number of almoſt imperceptible cubes incomparably greater, and that the laminæ applied on the different faces, which may be called the laminæ of ſuperpoſition, continue to increaſe towards their four edges by ſubtractions of one range of cubes equal to thoſe of the nucleus, the number of theſe laminæ will be incomparably greater than in the preceding hypotheſis; and at the ſame time the cavities or furrows which they form, as they alternately become ſalient or re-entering, will be almoſt imperceptible; and indeed it might be ſuppoſed that the cubes of which the cryſtal is compoſed are ſo ſmall as to become quite imperceptible to our ſenſes, and the faces of the pyramids to be perfectly ſmooth.

Now DCBE (fig. 20.) being the pyramid which reſts on the face ABCD (fig. 15.), and CBOG (fig. 20.) the pyramid applied to the face BCGH (fig. 15.), if we conſider that every thing is uniform from E to O (fig. 20.) in the manner in which the laminæ of ſuperpoſition mutually project beyond each other, we may readily conceive that the face CEB of the firſt pyramid ought to be exactly in the ſame plane as the face COB of the contiguous pyramid, ſo that the union of theſe two faces ſhould form a rhombus ECOB. But we have, for the 6 pyramids, 24 triangles ſimilar to CEB, which conſequently will be reduced to 12 rhombuſes, from which reſults a dodecahedron ſimilar to what is repreſented in fig. 13. and 14.

The cube, before it arrives at the form of the dodecahedron, paſſes through a multitude of intermediate modifications, of which one is ſhown at fig. 21. The ſquares *paeo*, *klqu*, *mnts*, &c. correſpond to the ſquares ABCD, DCGF, CBHG, &c. (fig. 14.), and form the ſuperior baſes of as many pyramids, incomplete from the deficiency of the laminæ with which they ought to terminate. The rhombuſes EDLC, ECOB (fig. 13.), by a neceſſary conſequence, are reduced to ſimple hexagons $aeClkD$, $eoBnmC$ (fig. 21.), and the ſurface of the ſecondary cryſtal is compoſed of 12 of theſe hexagons and 6 ſquares. This is the caſe with the boracic ſpar (the borate of magneſia and lime), with the exception of ſome facets which ſurmount the ſolid angles, and which depend on a different law of decrement.

If the diminution of the laminæ of ſuperpoſition proceeded in a more rapid ratio; for example, if each lamina had had on its circumference, two, three, or four rows of cubes leſs than the inferior lamina, the pyramids produced on the nucleus by this diminution being more depreſſed, and their contiguous faces being no longer on a level, the ſurface of the ſecondary ſolid would have been compoſed of 24 iſoſceles triangles, all inclined to each other. *Decrement on the edges*, is that which takes place parallel to the edges of the nucleus, and it ought to be diſtinguiſhed from another kind of decreaſe to be afterwards mentioned.

2. Examples of Decreaſe on the Edges.

Martial Pyrites, or *Dodecahedral Sulphuret of Iron.*

Geometric Character.—Inclination of any one of the pentagons, as DPRFS (fig. 27.), to the pentagon CPRGL, which has the ſame baſe PR, $126^\circ\ 56'\ 8''$. Angles of the pentagon CPRGL, $L = 121^\circ\ 35'\ 17''$; C or $G = 106^\circ\ 35'\ 57''\ 30'''$; P or $R = 102^\circ\ 36'\ 19''$.

Let us conceive again a cubic nucleus, whoſe different edges are lines of departure to the ſame number of decrements which take place at the ſame time in two different ways; that is, by the ſubtraction of two rows parallel to the edges AB, CD (fig. 15), and of one row parallel to the edges AB, BC. Let it be ſuppoſed alſo that each lamina being only equal in thickneſs to a ſmall cube of the ſide AB and CD, is on the contrary equal to double the thickneſs of the ſide AD and BC. Fig. 22. repreſents this diſpoſition with regard to the decrements which proceed from the lines DC, BC, (fig. 15.). It is plain that on account of the more rapid decreaſe in proceeding from DC or AB, than from BC or AD, the faces produced in the firſt caſe will be more inclined to the plane ABCD, while the faces produced in the ſecond will remain as it were behind, ſo that the pyramid will no longer be terminated by a ſingle cube E, as in fig. 20. which on account of its minuteneſs ſeems to be only a point, but by the row of cubes MNST (fig. 22.) which, ſuppoſing theſe cubes to be infinitely ſmall, will preſent the appearance of a ſimple ridge. By a neceſſary conſequence, the pyramid will have for its faces two trapeziums, ſuch as DMNC, reſulting from the firſt decrement, and two iſoſceles triangles, ſuch as CNB, which will be the effect of the ſecond decrement (c).

(c) Here the face which correſponds to ABCD (fig. 15.) has 25 ſquares on each ſide, as may be ſeen in fig. 22. The ſtructure of this pyramid may be imitated artificially, by regulating the arrangement and number of the cubes repreſented in the ſame figure.

Let us ſuppoſe farther, that with regard to the laminæ of ſuperpoſition, which ariſe on the face BCGH (fig. 15.), the decrements follow the ſame laws, but in croſs directions; in ſuch a way that the more rapid of the two may take place in proceeding from BC, or from GH, towards the vertex of the pyramid, and the ſlower decrement in proceeding from CG, or BH, towards the ſame vertex. The pyramid which reſults from theſe decrements will be placed in a direction oppoſite to that which reſts on ABCD, and will have the poſition repreſented at fig. 25. where the edge KL, which terminates the pyramid, inſtead of being parallel to CD, like the edge MN, (fig. 22. and 23.), is on the contrary parallel to BC. We ſhall then conceive what is to be done, that the pyramid which will reſt on DC, GF (fig. 15.) may be turned as it is repreſented in fig. 24. and may have its terminating edge PR parallel to CG (fig. 15.). The pyramids which will reſt on three other faces of the cube, will ſtand like that which ariſes on the oppoſite face.

But as the decrements which produce the triangle CNB (fig. 23.) make a continuity with thoſe from which reſults the trapezium CBKL (fig. 25.), theſe two figures will be in the ſame plane, and will form a pentagon CNBKL (fig. 26.). For the ſame reaſon the triangle DPC (fig. 24.), will be on a level with the trapezium DMNC (fig. 23.); and by applying the ſame reaſoning to the other pyramids, it will be conceived that the ſix pyramids having for their whole faces 12 trapeziums and 12 triangles, the ſurface of the ſecondary ſolid will be compoſed of 12 pentagons, which will correſpond to the 12 rhombuſes of fig. 13. but with this difference, that they will have other inclinations. This ſolid is repreſented at fig. 27. and with its cubic nucleus at fig. 28. where it may be ſeen how to proceed in the extraction of this nucleus. If, for example, a ſection be made paſſing through the points D, C, G, F, the pyramid which reſts on the face DCGF of the nucleus will be detached, and by this ſection the latter will be uncovered.

Among the cryſtals belonging to the ſulphuret of iron, or the arſeniate of cobalt, there is found a dodecahedron, having the faces equal and ſimilar pentagons, and having for its nucleus a cube in the poſition above deſcribed. But there are an infinite number of poſſible dodecahedra, which may have for faces equal and ſimilar pentagons, and will differ from each other by the reſpective inclinations of their faces. Of all theſe dodecahedra, the one whoſe ſtructure would be ſubjected to theſe laws, gives 126° 56′ 8″, as the angle formed by the inclination of any two of its faces DPRFS, CPRGL (fig. 27.) at the edge of junction PR, as might be ſhewn by calculation. Some mineralogiſts, overlooking the uſe of geometry in the conſideration of cryſtals, have confounded the dodecahedron of pyrites with the ſame regular, geometrical figure in which all the ſides and angles of each pentagon are equal; but there is a ſtriking difference between theſe two dodecahedra. The regular dodecahedron gives only 116° 33′ 54″, as the inclination of its reſpective pentagons, making a difference of nearly 11¼° between it and the other. And indeed the regular dodecahedron cannot be produced by any law of decrement whatever, however compound it may be ſuppoſed, in regard to a cubic nucleus; and, as may be demonſtrated generally, for a nucleus of any form. There are then two kinds of dodecahedra, one whoſe faces are rhombuſes, and another whoſe faces are pentagons, produced upon a cubical nucleus, in conſequence of two ſimple and regular laws of decrement, in a direction parallel to the edges of the nucleus. By varying theſe laws in different other ways, a multitude of new polyhedra, having the ſame nucleus, may be conſtructed.

Obtuſe, or Lenticular Calcareous Spar, (fig. 30.).

Geometric Character.—Inclination of the rhombus $nad'b'$, to the rhombus $aif'd'$, 134° 25′ 36″. Angles of the rhombus $nadb'$; a or $b' = 114°\ 18'\ 56''$; n or $d' = 65°\ 41'\ 4''$.

This variety ariſes from a decrement by a ſingle row on both ſides of the edges ab, ag, af (fig. 31.) and eo, ed, ex, contiguous to the ſummits a, e, of the nucleus. An idea may be formed of its ſtructure, by comparing it with that of the dodecahedron whoſe planes form rhombuſes (fig. 13. and 20.), originating from the cube, (fig. 15.); and by ſuppoſing that the laminæ, inſtead of decreaſing at the ſame time on all the edges, decreaſe only to thoſe contiguous, three by three, to the angle C and its oppoſite. The faces formed in that caſe will be reduced to ſix, which, by prolonging themſelves, according to the law of continuity, ſo as to interſect each other, will compoſe the ſurface of a rhomboid analogous to the one which we are now treating of, excepting that it will have other angles, on account of the cubical form of its integral molecule.

From this it may be conceived, that the diagonals drawn from a to b' (fig. 30.), from a to g', from a to f', &c. on the ſecondary rhomboid, will be confounded with the edges ab, ag, af (fig. 31.) of the nucleus, which ſerve as lines of departure for the decrements; and hence to extract this nucleus, the planes of the ſections muſt paſs along theſe diagonals, as has been already remarked.

Common Topaz, (fig. 33.).

Geometric Character.—The inclination of the trapezoid $srtm$ to the adjacent plane $rtey$, 136°; of the ſame plane, to $kryz$, 124° 26′; of the plane $tmge$, to $mlig$, 93°.

The primitive form of this topaz is that of a right-angled, four-ſided priſm by (fig. 32.), the baſes of which are rhombuſes, having the angle h or $r = 124°\ 26'$. According to theory, in regard to the integrant molecule, the height ry is to the ſide rn nearly in the ratio of 3 to 2. The pyramidal ſummit of the topaz reſults from a decrement by two rows of ſmall priſms on the edges xr, rn, nh, hx of the ſuperior baſe of the primitive form. The planes $tmge$, $lmge$ (fig. 33.) on one ſide, and $bkzp$, $budp$, on the other, ariſe from a decrement by three rows on each ſide of the edges nv, xq (fig. 32.), which decrement remains ſuſpended at a certain term, and leaves four rectangles $trye$, $kryx$, $lhci$, $uhcd$, (fig. 33.), parallel to the planes of the primitive form. The effect of this decrement is ſhewn at fig. 34. where the rhombus $hnrx$ is the ſame as fig. 32; and all the ſmall rhombs by which it is ſubdivided, or which are exterior to it, repreſent the baſes of ſo many molecules. The lines xd, xz, ni, ne, are directed according to the law of decrement already explained, and the lines cd, ci, yz, yc, correſpond to the planes of the priſm, which are not ſubject to this law.

3. Decrement on the Angles.

This poſition of the rhomboidal nucleus incloſed in the regular hexahedral priſm of the calcareous ſpar being diſcovered, did not directly lead to the determination of the laws of thoſe decrements of ſecondary cryſtals. More ſimple intermediate ſteps were neceſſary. To conceive the method of inveſtigating theſe new decrements, it may be remarked that the ſame ſubſtances which exhibit the dodecahedron with pentagonal planes originating from the cubes (fig. 27. and 28.), and which might aſſume the form of the dodecahedron whoſe planes are rhombuſes (fig. 13. and 14.), are found alſo under that of the regular octahedron. But if the laminæ of ſuperpoſition decreaſe only on the edges of the two oppoſite faces of this cube, as on thoſe of the ſuperior baſe ABCD (fig. 14.) and of the inferior baſe, we ſhall in general have two pyramids applied on theſe baſes. And if we ſuppoſe the effect of the law of decrements continued in the ſpace ſituated between the baſes of the cube, we ſhall arrive at an octahedron, whoſe angles will vary as there is a greater or ſmaller number of rows ſubtracted. But no law, however complicated, can give equilateral triangles as the faces of this octahedron.

On the other hand, by dividing a regular octahedron originating from a cube, the cubic nucleus will appear to be ſo ſituated in this octahedron that each of its ſix ſolid angles correſponds to the centre of one of the faces of the octahedron; but this could not be the caſe by ſuppoſing a decrement on the edges. The law of decrement accompliſhes its ends, in ſuch caſes, by a different progreſs from that which conducts to the forms already deſcribed.

Let ABCD (fig. 35.) be the ſuperior or inferior ſurface of a lamina compoſed of ſmall cubes, whoſe baſes are repreſented by the ſquares which ſubdivide the whoſe ſquare. The ſeries of cubes to which the ſquares a, b, c, d, e, f, g, h, i, belong, are on the diagonal drawn from A to C; and they form one ſtring, (fig. 36.) which will not differ from the ſtring of the cubes a, n, g, r', s', t', u', z', x', (fig. 35.), lying in the direction of the edge AD, excepting that in the former the cubes touch only by one of their edges, and in the latter by one of their faces. There are alſo, throughout the whole extent of the lamina, ſtrings of cubes parallel to the diagonal. The ſeries of letters q, v, k, u, x, y, z, ſhews one, and the letters n, i, l, m, p, o, r, s, ſhew another ſtring.

The laminæ of ſuperpoſition, it may be conceived, project beyond each other one or more rows of cubes in a direction parallel to the diagonal. In like manner may be conſtructed around the cubic nucleus, ſolids of different figures, by placing ſucceſſively above the different faces of this nucleus laminæ which may ariſe in the form of pyramids, and which will experience this kind of decrement. The faces of theſe ſolids will be roughened by an infinite number of ſalient angles formed by the exterior points of the compoſing cubes. This follows from the angular figure which is continually preſented by the edges of the laminæ of ſuperpoſition. But theſe points being on a level, the cubes may be ſuppoſed to be ſo ſmall that the faces of the ſolid will appear ſmooth and continued planes.

Around the cube ABGF (fig. 37.), as a nucleus, let a ſecondary ſolid be conſtructed, in which the lamina of ſuperpoſition ſhall decreaſe on all ſides by a ſingle row of cubes, in a direction parallel to the diagonals; and let ABCD (fig. 38.), the ſuperior baſe of the nucleus, be ſubdivided in 81 ſmall ſquares, repreſenting the exterior faces of an equal number of molecules. Fig. 39. repreſents the ſuperior ſurface of the firſt lamina which ought to be placed above ABCD (fig. 38.) in ſuch a manner that the point a' may correſpond to the point a, the point b' to the point b, the point c' to the point c, and the point d' to the point d. By this diſpoſition the ſquares A a, B b, C c, D d (fig. 38.) remain uncovered, which will fulfil the above law of decrement; and the borders QV, ON, IL, GF (fig. 39.) project by one row beyond the borders AB, AD, CD, BC (fig. 37.) which is neceſſary that the nucleus may be enveloped towards theſe edges. For if the edges of the lamina, repreſented (fig. 39.) as well as the following, coincided with the lines ST, EZ, YX, MU, on which ſuppoſition they would be on a level with AD, AB, CD, BC (fig. 38.), they would form re-entering angles towards the analogous parts of the cryſtal. Thus in the laminæ applied on ABCD (fig. 37.) all the edges anſwering to CD would be on a level with CDFG, of which they would form a prolongation; and in the laminæ applied on DCGF all the edges analogous to the ſame ridge CD would be on a level with ABCD, from which neceſſarily reſults a re-entering angle oppoſite to the ſalient angle formed by the two faces ABCD, and CDFG. But by the laws which determine the formation of ſimple cryſtals, re-entering angles appear to be excluded. The ſolid will then increaſe in thoſe parts to which the decrement does not extend. But this decrement alone being ſufficient to determine the form of the ſecondary cryſtal, all the other variations which intervene only in a ſubſidiary manner may be ſet aſide, excepting in the conſtruction of artificial cryſtals, and in exhibiting the the details relating to the ſtructure.

The ſuperior face of the ſecond lamina will be like A′G′LK′ (fig. 40.), and this lamina muſt be placed above the preceding, in ſuch a manner that the points a'', b'', c'', d'', may correſpond with the points a', b', c', d' (fig. 39.), which will leave uncovered the ſquares having their exterior angles ſituated in Q, S, E, O, V, T, M, G, &c and continuing to produce the decrement by one row. The ſolid increaſes towards the analogous edges at AB, BC, CD, AD (fig. 38.), ſince between A′ and L′, for inſtance, (fig. 40.) there are 13 ſquares, but between QV and LI (fig. 39.) there are only eleven.

The large faces of the laminæ of ſuperpoſition which were hitherto octagons QVGFILNO (fig. 39.) having arrived at the figure of the ſquare A′G′L′K′ (fig. 40.) will after paſſing that term, decreaſe on all ſides at the ſame time, and the following lamina will have for its ſuperior face the ſquare B′M′I′S′ (fig. 41.), leſs in every direction by one row than the ſquare A′G′L′K′ (fig. 40.). Let this ſquare be diſpoſed above the preceding ſo that the points c', f', g', h' (fig. 41.) may correſpond with the points *c*, *f*, *g*, *h*, (fig. 40.). Fig. 42. 43. 44. and 45. repreſent the four laminæ which ought to riſe ſucceſſively above the preceding, the ſame letters being made to correſpond. The laſt lamina is reduced to one cube *z′* (fig. 46.) which ſhould correſpond with the ſame letter (fig. 45.).

Thus it follows, that the laminæ of ſuperpoſition applied on the baſe ABCD (fig. 37. and 38.) produce, by the total of their decreaſing edges, four faces, which in proceeding from the points A, B, C, D, incline one to another in the form of a pyramidal ſummit. Theſe edges, it may be remarked, have lengths which begin by increaſing as in fig. 39. and 40. and which then proceed decreaſing. Thus the faces produced by the ſame edges increaſe at firſt, and afterwards decreaſe in breadth, ſo that they become quadrilaterals. One of theſe is repreſented at fig. 47. in which the inferior angle C is confounded with the angle C (fig. 37.) of the nucleus; and the diagonal LQ repreſents the edge L′G′ of the lamina A′G′L′K′ (fig. 40.), which is the moſt extended in the direction of that edge. And the number of laminæ of ſuperpoſition producing the triangle LCQ (fig. 47.) being leſs than that of the laminæ producing the triangle LZQ, ſince there is here only one lamina preceding the lamina A′G′L′K′ (fig. 40.), while there are ſix which follow it as far as the cube *z* (fig. 46.) incluſively, the triangle LZQ (fig. 47.) compoſed of the ſum of the edges of theſe latter laminæ, will have a much greater height than the inferior triangle LCQ, as it is expreſſed in the figure.

The ſurface of the ſecondary ſolid, then, will be formed of 24 quadrilaterals, diſpoſed three and three around each ſolid angle of the nucleus. But decreaſing by one row, the three quadrilaterals belonging to each ſolid angle, ſuch as C (fig. 37.), will be in the ſame plane, forming an equilateral triangle ZIN (fig. 48.). The 24 quadrilaterals, then, will produce eight equilateral triangles. One of theſe is repreſented at fig. 49. ſhewing the arrangement of the cubes that concur to form it; and the ſecondary ſolid will be a regular octahedron. This octahedron is repreſented at fig. 50. encloſing the cubic nucleus, ſo that each of its ſolid angles correſponds to the centre of one of the triangles IZN, IPN, PIS, SIZ, &c. of the octahedron. To extract this nucleus, it would be neceſſary to divide the octahedron in its eight ſolid angles, by ſections parallel to the oppoſite edges. This is the ſtructure of octahedral ſulphuret of lead or galena.

Such then is an example of decrements on the angles which take place in a direction parallel to the diagonals. By this denomination may be expreſſed preciſely the reſult of each decrement, by denoting the angle which ſerves it as a point of departure.

Acute calcareous Spar, (fig. 51.).

Geometric Character.—Inclination of *p z r y* to *p u o y*, 78° 27′ 47″, and to *i r z s*, 101° 32′ 13″. Angles of the rhombus *p z r y*, *p* or *r* = 75° 31′ 20″; *z* or *y* = 104° 28′ 40″. Inclination of the oblique diagonal drawn from *p* to *r* with the edge *p u*, 71° 33′ 54.″

Geomet. Propert.—The angles of the rhombus are equal to the repective inclinations of the faces of the nucleus, and reciprocally. The angles of the principal quadrilateral, or that which paſſes through two oppoſite oblique diagonals *p r*, *u i*, and through the intermediate edges *p u*, *i r*, are the ſame as on the nucleus.

To conceive the ſtructure of this rhomboid, ſuppoſe that *a b d f* (fig. 52.) repreſents the face of the nucleus marked with the ſame letters (fig. 12.) ſubdivided into a multitude of partial rhombuſes, which are the exterior faces of ſo many molecules. Suppoſe farther, that the laminæ of ſuperpoſition, applied on this face, decreaſe by one row towards the lateral angles *a b d*, *a f d*, in ſuch a manner, that on the firſt the two rhombuſes *b h k l*, *f m i n* are uncovered; that on the ſecond the uncovered rhombuſes are thoſe traverſed by the diagonals *c o*, *u y*, on the third thoſe traverſed by the diagonals *s t*, *q z*, &c.; in which caſe the decreaſing edges will ſucceſſively correſpond with theſe diagonals. By this law of decrement two faces will be produced; which, proceeding from the angles *b f*, will riſe in the form of a roof above the rhombus *a b d f*, and will meet on a common edge ſituated immediately above the diagonal *a d*, and which will be parallel to it; and, as there are ſix rhombuſes, which undergo like decrements on the primitive form, the faces produced will be 12 in number. But, by the law of decrement by one row, the two faces which have the ſame angle *b*, *f*, *g*, &c. (fig. 12.) for the point of departure will be in the ſame plane; thus reducing the 12 faces to ſix, and transforming the ſecondary cryſtal into an acute rhomboid *p i* (fig. 51.). In this rhomboid the edges *p z*, *p y*, *p u*, are ſituated each as the oblique diagonals of the nucleus, or thoſe which would be drawn from *a* to *d*, from *a* to *x*, from *a* to *c*, &c. (fig. 12.).

Cryſtals of this variety are found near Lyons in France; and the freeſtone of Fontainbleau, commonly called *cryſtallized ſandſtone*, which is nothing elſe than calcareous ſpar, mixed with particles of quartz, exhibits the ſame form. The cryſtals of this ſtone yield to mechanical diviſion, and have their natural joinings like thoſe of pure ſpar, ſituated in the planes parallel to the edges *p z*, *p y*, *p u*, &c. (fig. 51.), and which would paſs at an equal diſtance from theſe edges.

Rhomboidal Iron-ore, (fig. 53.).

Geometric Character.—Inclination of BCRP to BCOA or OCRS, 146° 26′ 33″; angles of the rhombus BCRP, C or P=117° 2′ 9″; B or R=62° 57′ 51″.

The laminæ compoſing this rhomboid decreaſe by two rows on the angles *b c r*, *o c r*, *b c o*, &c. (fig. 54.) which concur to the formation of the two ſolid angles *c n*, of a cubic nucleus. The faces produced, inſtead of being on a level, three and three, around theſe angles, as in the caſe of decrement by a ſingle row, incline one to the other, and extend above the faces of the nucleus in ſuch a manner that their diagonals are parallel to the horizontal diagonals of the ſame faces. The cube here anſwers the purpoſe of a rhomboid, which ſhould have its ſummits in *c* and *n*, in which caſe there would be only one axis paſſing through the ſummits. In the dodecahedron, on the other hand, with pentagonal planes,

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planes (fig. 27.) the cube performs the functions of a rectangular parallelopipedon, and then three different axes may be conceived, each of which paſſes through the middle of the two oppoſite faces. When the cube begins to perform the one or the other, in regard to one ſpecies of mineral, it is obſerved to continue that function in all the varieties of that ſpecies.

The cryſtals of rhomboidal iron are found among thoſe of the iron ore of the iſland of Elba. It is uncommon, however, for the law of decrement to attain to its boundary, and for the rhomboid not to be modified by facets parallel to the faces of the nucleus. If the decrement which produces the rhomboid took place at the ſame time on the eight ſolid angles of the cube, there would reſult a polyhedron of 24 facets, of which nature are the cryſtals found at the Calton hill, Edinburgh, which have been conſidered as zeolites.

4. Intermediate Decrements.

In ſome cryſtals the decrements on the angles do not take place in lines parallel to the diagonals, but parallel to lines ſituated between the diagonals and the edges. This happens when the ſubtractions are made by double, triple, &c. rows of molecules. In figure 55. which is an inſtance of theſe ſubtractions, the molecules compoſing the row repreſented by the figure, are ſo arranged as if, of two, one only was formed. To reduce this caſe under that of the common decrements on the angles, we have only to conceive the cryſtal compoſed of parallelopipeds, having their baſes equal to the ſmall rectangles *a b c d*, *e d f g*, *h g i l*, &c. The name of intermediate decrement is given to this kind of diminution.

Syntactic Iron Ore, (fig. 50.)

Geometric Character.—Reſpective inclination of the trapeziums *b e g o*, *n q g o* of the riſing pyramids =135° 34′ 31″; of the edges *c g*, *g q*, 129° 31′ 16″. Angles of the trapezium *b c g o*, *b* or *c*=103° 48′ 35″; *o* or *g*=76° 11′ 25″.

This variety of iron ore is found at Framont in Les Voſges. It commonly appears under the form of two oppoſite pyramids, and ſome groups reflect from the ſurface the priſmatic colours. Theſe cryſtals, claſſed by De L'Iſle among the modifications of the dodecahedron with iſoſceles triangular planes, have for nucleus a cube performing the functions of the rhomboid. The two regular hexagons by which they are terminated, ariſe from a decrement by a ſingle row of cubic molecules on the angles *c*, *n*, (fig. 54.) of the nucleus.

To comprehend the effect of this law, combined with the preceding, and which produces the lateral trapeziums, let it be ſuppoſed that *c b p r* (fig. 57.) repreſents the ſame ſquare as fig. 54. ſubdivided into ſmall ſquares, which are the external faces of ſo many molecules. Taking theſe molecules by pairs, ſo that they form rectangular parallelopipeds, having for baſes the oblong ſquares *b n g h*, *h g m* G, &c. and imagine, that the ſubtractions are made by two rows of theſe double molecules, the edges of the laminæ of ſuperpoſition will be ſucceſſively ranged in lines, as FG, TL, R *r*, S *p*, *k z*, *y z*, &c. and the ſum of all theſe edges will produce two faces, which departing from the angles *b*, *r*, will converge, the one towards the other, and will unite themſelves on a common ridge, ſituated above the diagonal *c p*, but inclined to that diagonal. The complete reſult of this decrement, then, is 12 faces; and it is ſhewn by calculation, that the ſix ſuperior faces being prolonged to the point where they meet the ſix lower faces, will form with them the ſurface of a dodecahedron, compoſed of two right pyramids united at their baſes. By the effect of the firſt law, theſe pyramids are here incomplete, which gives the hexagon *a b c d r u* (fig. 56.) and its oppoſite.

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5. Mixed Decrements.

The decrements in other cryſtals, either on the edges, or on the angles, vary according to laws, the proportion of which can only be expreſſed by the fraction $\frac{2}{3}$ or $\frac{3}{4}$. It may happen, for inſtance, that each lamina exceeds the following by two rows parallel to the edges, and that it may, at the ſame time, have an altitude triple that of a ſimple molecule. A vertical, geometrical ſection of one of the kinds of pyramids, reſulting from this decrement, is repreſented at fig. 62. The effects of this decrement may be readily conceived by conſidering that AB is a horizontal line taken on the upper baſe of the nucleus *b a z r*, the ſection of the firſt lamina of ſuperpoſition, *g f e n* that of the ſecond. Theſe are called *mixed decrements*, which exhibit this new kind of exception from the ſimpleſt laws. They, as well as the intermediary ones, rarely exiſt anywhere elſe, and they have been particularly diſcovered in certain metallic ſubſtances. The application of the ordinary laws, Hauy obſerves, to a variety of theſe ſubſtances, preſented ſuch errors in the value of the angles, as led him to believe that they were inconſiſtent with theory. But extending his theory, he arrived at reſults ſo correct as removed every doubt of the exiſtence of the laws on which theſe reſults depended.

All the changes to which cryſtals are ſubjected depend on the laws of ſtructure which have been explained, and others of a ſimilar kind. The decrements ſometimes take place at the ſame time on all the edges, as in the dodecahedron having rhombuſes for its planes, or on all the angles, as in the octahedron originating from a cube. Sometimes they take place only on certain edges of certain angles. There is ſometimes a uniformity between them, ſo that it is one ſingle law by one, two, three rows, &c. which acts on the different edges, or the different angles. Sometimes the law varies from one edge to the other, or from one angle to the other. This happens particularly, when the form of the nucleus is not ſymmetrical, as, for inſtance, when it is a parallelopiped, whoſe faces differ by their reſpective inclinations, or the meaſure of their angles. In ſome caſes there is a concurrence of the decrements on the edges, with thoſe on the angles, to produce the ſame form; and ſometimes the ſame edge or the ſame angle is ſubjected to ſeveral laws of decrement ſucceeding each other. The ſecondary cryſtal, in ſome caſes, has faces parallel to thoſe of the primitive form, and which combine with the faces produced by the decrements to modify the figure of the cryſtal. Simple ſecondary forms, are thoſe which ariſe from a ſingle law of decrement, the effect of which entirely conceals the nucleus. Compound ſecondary forms ariſe from ſeveral ſimultaneous laws of decrement, or from one ſingle law not having attained to its extent; ſo that there remain

main faces parallel to thoſe of the nucleus, which concur with the faces produced by the decrement, to diverſify the form of the cryſtal. If, amidſt this diverſity of laws, ſometimes inſulated, ſometimes united by more or leſs complicated combinations, the number of the rows ſubtracted were itſelf extremely variable; if, for inſtance, theſe decrements were by 12, 20, or 30 rows, or more, which is poſſible, the number of forms which might exiſt in each kind of mineral would be immenſe. But the power by which the ſubtractions are effected, ſeems to be very limited in its action. Its extent rarely exceeds 1 or 2 rows of molecules. Beyond four rows, only one variety of calcareous ſpar has been diſcovered. The ſtructure of this variety depends on a decrement by ſix rows; but this ſeems to be a rare occurrence in nature. Yet, although the laws of cryſtallization are limited to two of the ſimpleſt, that is, thoſe which produce ſubtractions by one or two rows, calcareous ſpar is ſuſceptible of 2044 different forms, a number exceeding more than 50 times that of the forms at preſent known; and, admitting into the combination decrements by 3 and 4 rows, calculation will give 8,388,604 poſſible forms of the ſame ſubſtance, and by the operation of either mixed or intermediate decrements, this number will be greatly augmented.

The ſtriæ obſerved on the ſurface of many cryſtals is another proof in favour of the theory; for they always have directions parallel to the projecting edges of the laminæ of ſuperpoſition, which mutually go beyond each other, if the regularity of the proceſs has not been diſturbed. It muſt not, however, be ſuppoſed, that the inequalities ariſing from the decrements muſt be always ſenſible, if the form of the cryſtals be complete; for the molecules being extremely minute, the ſurface will appear finely poliſhed, and no ſtriæ would be perceptible. In ſome ſecondary cryſtals, therefore, they are not to be ſeen, while they are quite diſtinct in others of the ſame nature and form. In the latter caſe, the action of the cauſes producing cryſtallization, has not enjoyed all the neceſſary conditions; the operation has been interrupted; and the law of continuity not having been obſerved, there have remained on the ſurface of the cryſtal, perceptible vacancies. Theſe deviations have this advantage, that they point out the direction, according to which the ſtriæ are arranged in lines, and thus contribute to diſcover the real mechaniſm of the ſtructure.

The ſmall vacuities which the edges of the laminæ of ſuperpoſition leave on the ſurface of even the moſt perfect ſecondary cryſtals, by their re-entering and ſalient angles, ſhew that the fragments obtained by diviſion, whoſe external facets form part of the faces of the ſecondary cryſtal, are not like thoſe drawn from the interior part. For this apparent diverſity ariſes from theſe facets being compoſed of a multitude of ſmall planes, really inclined to each other, but which being very minute, preſent the appearance of one plane. And if the diviſion could reach its utmoſt bounds, theſe fragments would be reſolved into molecules ſimilar to each other, and to thoſe ſituated towards the centre. It happens, too, that molecules of different figures arrange themſelves in ſuch a manner, as to produce ſimilar polyhedra in different kinds of minerals. Thus the dodecahedron with rhombuſes for its planes, which is obtained by combining cubic molecules, exiſts in granite, with a ſtructure compoſed of ſmall tetrahedra, having iſoſceles triangular faces. It exiſts alſo in ſparry fluor, where there is alſo an aſſemblage of tetrahedra, but regular; that is to ſay, the faces of which are equilateral triangles.

Examples of Compound Secondary Forms.

Priſmatic Calcareous Spar, (fig. 9.)

The baſes of this priſm are produced in conſequence of a decrement, by a ſingle row on the angles of the ſummits baf, gaf, bag, dex, dec, cex (fig. 12.) of the primitive form. The ſix planes reſult from a decrement by two rows on the angles bdf, fxg, bcg, dfx, dbc, cgx, oppoſite to the preceding. Let $abdf$ (fig. 58.) be the ſame face of the nucleus, as fig. 12. The decreaſing edges ſituated towards the angle of the ſummit a, will ſucceſſively correſpond with the lines hi, kl, &c. and thoſe which look towards the inferior angle d, will have the poſitions pointed out by mn, op: but as the firſt decrement takes place by one row, it is proved, that the face which reſults from it is perpendicular to the axis; and calculation ſhews, in like manner, that the ſecond decrement taking place by two rows, produces planes parallel to the axis, and thus the ſecondary ſolid is a regular hexahedral priſm.

To develope farther the ſtructure of this priſm, it may be remarked, that in the production of any one $abcnih$ (fig. 9.) of the two baſes, the effect of one only of the three decrements which take place around the ſolid angle a (fig. 12.) may be conſidered, for example, of that which takes place on the angle baf, ſuppoſing that the laminæ applied on the two other faces $fagx$, $bagc$, do not decreaſe, but to aſſiſt the reſult of the principal decrement which takes place in regard to the angle baf. Here theſe auxiliary decrements are quite ſimilar to that whoſe effect they are ſuppoſed to prolong.

The caſe will be totally different by applying the ſame obſervation to the decrements which are affected by two rows on the inferior angles bdf, dfx, fxg, &c. and which produce the ſix planes of the priſm. If, for example, we conſider the effect of the decrement on the angle dfx, it is neceſſary alſo that the laminæ applied on the faces $afdb$, $afxg$ (fig. 12.) ſhould experience, towards their lateral angles afd, afx, adjacent to the angle dfx, variations which ſecond the effect of the generating decrement. Here, however, theſe variations are intermediary decrements by rows of double molecules.

Amphitrigonous Iron Ore. Fig. 59. ſhews this cryſtal in a horizontal projection, and fig. 60. in perſpective.

Geometric Character.—Reſpective inclination of the triangles gcn, gcd, &c. from the ſame ſummit, $146^{\circ}\ 26'\ 33''$; of the lateral triangles bgu, bgq, to the adjacent pentagons, ſuch as $gutmn$, $154^{\circ}\ 45'\ 39''$.

This is the common form of the iron ore of the iſland of Elba. It reſults from a decrement by two rows on the angles c, n (fig. 54.) to the ſummits of a cubic nucleus, which produces the iſoſceles triangles gcn, gcd, ncd (fig. 59. and 60.), and of a ſecond decrement by three rows on the lateral angles cbp, crp, crs, &c. which produce the triangles mnr, rnk, ugb, ggb, &c. Theſe two decrements ſtop at a certain term, ſo that there remain faces parallel to thoſe of the nucleus, viz. the pentagons *g u t m n*, *h d n k l*, &c. (fig. 59.). The firſt decrement is ſimilar to that which produces the rhomboidal iron ore. The ſecond has this property, that if its effect were complete, it would give a dodecahedron of iſoſceles triangles, or compoſed of two right pyramids united at their baſes. The triangles of the ſummits are frequently furrowed by ſtriæ parallel to the baſes *g n*, *d n*, *g d*, of theſe triangles, and which point out the direction of the decrement.

Analogical Calcareous Spar, (Hauy), fig. 61.

Geometric Character.—Inclination of any one, *i m e h*, of the trapezoids of the ſummits to the correſponding vertical trapezoid *e c p g*, 116° 33′ 54″; angles of the ſame trapezoid *i*=114° 18′ 56″; *e*=75° 31′ 20″; *m* or *h*=85° 4′ 52″. Angles of the trapezoid *e h o g*, *e*=90°; *o*=127° 25′ 53″; *g*=67° 47′ 44″; *h*=74° 46′ 23″; of the trapezoid *c e g p*, *e*=60°; *p*=98° 12′ 46″; *c* or *g*=100° 53′ 37″.

Geomet. Propert.—1. In each vertical trapezoid, the triangle *c e g* is equilateral. 2. The height *e x* of this triangle is double the height *p x* of the oppoſite triangle *c p g*. 3. In the trapezoid *e h o g*, and the other ſimilarly ſituated, the angle *h e g* is a right angle. 4. If the diagonal *g h* be drawn, the triangle *h e g* will be ſimilar to any one *a o f* (fig. 12.) of thoſe which would be produced by drawing in the primitive rhombus the two diagonals *b f*, *a d*. 5. If in the trapezoid *e m i h*, or any other ſituated at the ſummits, the diagonals *e i*, *m h* be drawn, the height *e l* of the inferior triangle *m e h* will be double the height *i l* of the ſuperior triangle *m i h*. 6. The triangle *m i h* is ſimilar to $\frac{1}{2}$ of the rhombus of very obtuſe ſpar, divided by the horizontal diagonal, and the triangle *m e h* is ſimilar to $\frac{1}{2}$ of the rhombus of the acute ſpar divided in the ſame manner.

The numerous analogies connecting this variety with different cryſtalline forms, whether conſidering certain angles formed by planes, or certain triangles obtained by drawing the diagonals of the trapezoids, led the author of this theory to give it the name of *analogical ſpar*. It is derived from three other varieties, viz. very obtuſe ſpar, by the trapezoids *e m i h*, *f i h t*, &c.; metaſtatic ſpar, by the trapezoids *e m d c*, *e h o g*, *o h t z*, &c.; and the priſmatic ſpar by the trapezoids *b d c k*, *c e g p*, &c. which are conſequently parallel to the axis. The trapezoids *i m e h*, *f i h t*, &c. are often ſeparated by an intermediary ridge from the vertical trapezoids *c e g p*, *g o z r*, &c. In that caſe the trapezoids *c d m e*, *g e h o*, &c. are changed into pentagons.

Icoſahedral Sulphuret of Iron, (fig. 63.).

Geometric Character.—Reſpective inclinations of the iſoſceles triangles PLR, PSR, 126° 52′ 11″; of any one PNL of the equilateral triangles to each adjacent iſoſceles triangle, PLR, or LNK, 140° 46′ 17″. Angles of the iſoſceles triangle PLR, L=48° 11′ 20″; P or R=65° 54′ 20″.

This variety is the reſult of a combination of the law which produces the octahedron originating from a cube (fig. 50.), with that which takes place for the dodecahedron with pentagonal planes (fig. 27. and 28.). The firſt law produces the eight equilateral triangles which correſpond with the ſolid angles of the nucleus; and the ſecond produces twelve iſoſceles triangles, ſituated two and two above the ſix faces of the ſame nucleus. If a dodecahedron ſimilar to that of fig. 28. were converted geometrically into this icoſahedron, it would be ſufficient to make the planes of eight ſections paſs through it in the following manner; viz. one through the angles P, N, L, (fig. 27.), another through the angles P, M, S; a third through the angles L, R, U, &c. By comparing the figures 27. and 63. the relation between the polyhedra will be ſeen by the correſpondence of the letters; but this is merely an artificial operation; for it may be obſerved, that the nucleus of the icoſahedra which would be obtained, would be much ſmaller than that of the dodecahedron, ſince the ſolid angles of the latter nucleus would be confounded with the angles D, C, G, &c. (fig. 28.) of the dodecahedron; but the other nucleus would have its ſolid angles ſituated in the middle of the equilateral triangles MPS, NPL, URL, (fig. 63.).

The icoſahedron of the ſulphuret of iron, which is not very common, has been confounded with the regular geometrical icoſahedron which has all its angles equilateral. Theory ſhows that the exiſtence of the latter icoſahedron is equally impoſſible in mineralogy as the geometrical dodecahedron. Among the five regular polyhedra of geometry, viz the cube, the tetrahedron, the octahedron, the dodecahedron, and the icoſahedron, the three former can only exiſt among minerals according to the laws of cryſtallization.

Polynomous Petunze (Hauy), fig. 64.

Geometric Character.—Reſpective inclination of the narrow planes, *o n k m*, *c f h g*, to the adjacent planes on each ſide 150°; of the planes *c t* F *g*, P *o m* N to thoſe contiguous to them by the edges *t* F, PN, 120°; of the heptagon *p* G *c l d e z* to the enneagon B *z e b n o* P *r s*, 99° 41′ 8″; of the trapezium *d a f c* both to the plane *n b a f h i l k*, and to the heptagon *p* G *t c d e z*, 135°; of the facet *d e a b*, or AB *z p* to the ſame heptagon, 124° 15′ 15″.

Hauy had not obſerved the petunze cryſtallized under its primitive form. This form, ſuch as it is given by the mechanical diviſion of ſecondary cryſtals, is that of an oblique priſm of four planes (fig. 66.), two of which, ſuch as GOAD, RBHN, are perpendicular to the baſes ADNH, OGRB; the other two, viz. BOAH, RGDN, make with the former, angles of 120° at the ridges OA, RN, and angles of 60° towards the oppoſite ridges BH, GD. Theſe planes are inclined to the baſes at the place of the ridges GO, BR, 111° 29′ 43″, and at the oppoſite ridges 68° 30′ 17″. This form is at the ſame time that of the molecule. By theory, the two parallelograms GOAD, OGRB, as well as their parallels, are equal in extent; and the parallelogram BOAH, or its oppoſite, RGDN, is double each of the preceding. This may ſerve to explain the roughneſs of the ſections made in the direction BOAH, when compared with thoſe in the directions of the ſmall parallelograms, the latter being always ſmooth and brilliant. If, however, the diagonal OR, be drawn, it will be found perpendicular to OA and RN; or, it will be ſituated horizontally,

tally, by ſuppoſing that the ridges OA, BH have a vertical poſition.

This mineral exhibits the moſt complicated variety which the author has obſerved among this kind of cryſtals. To comprehend its ſtructure, ſuppoſe that *b p y r*, (fig. 65.) repreſents a ſection of the nucleus AR, (fig. 66.), made by a plane perpendicular to the parallelograms GOAD, BOAH, and ſubdivided into a multitude of ſmall parallelograms, which are the analogous ſections of ſo many molecules. Here the ſide *y r* (fig. 65.), which is the ſame ſection of the cutting plane as GOAD, is greater than it ought to be in regard to the ſide *c r* (fig. 65.), which is the ſame ſection as BOAH (fig. 66.). But theſe dimenſions are ſuited to thoſe of the ſecondary cryſtal, and here occaſion no difficulty, becauſe it may be ſuppoſed that the primitive form has been extended more in one direction than in another; for this form is to be conſidered only as a convenient datum for the explanation of the ſtructure, and the cryſtal conſiſts merely in an aſſemblage of ſimilar molecules; ſo that it is the dimenſions of theſe molecules, which remain invariable.

By comparing fig. 64. and 65. it will be found, 1. That the plane *f a b n k l i h* (fig. 64.) and its oppoſite which correſpond to *m n*, *d g* (fig. 65.) are parallel to two planes of the nucleus, viz. GOAD, BRNH (fig. 66.), and therefore do not reſult from any law of decrement. 2. That the plane P *o m* N, and its oppoſite (fig. 64.) which correſpond to *a o*, *e g*, (fig. 65.) are alſo parallel to two of the planes of the nucleus, viz. BOAH RGDN, (fig. 66.). 3. That the plane *o n k m*, and its oppoſite (fig. 64.) which correſpond to *o n*, *e g*, (fig. 65.) reſult from a decrement by two rows parallel to the ridges AO, NR, (fig. 66.) 4. That the plane *c f g h*, and its oppoſite, (fig. 64.), reſult from a decrement by four rows parallel to the ridges GD, BH, (fig. 66.), which decrement takes place on the other ſide of theſe ridges. From this it may be ſeen, that decrements different in their meaſure, give riſe to planes ſimilarly ſituated, ſuch as *o n k m* and *c f g h*, (fig. 64.), which is a conſequence of the particular figure of the molecules. With regard to the faces of the ſummit, the heptagon *p* G *t c d e z*, (fig. 64.), is ſituated parallel to the baſe BRGO, (fig. 66.). The enneagon B *s r* P *o n b e z* (fig. 64.) is produced in conſequence of a decrement by one row on the angle OBR (fig. 66.), or parallel to the diagonal OR; which decrement does not attain to its full extent, and leaves ſubſiſting the neighbouring heptagon parallel to the baſe BRGO. It may be conceived, from what has been ſaid on the poſition of the diagonal OR, why the line *e z* (fig. 64.), which ſeparates the two large faces of the ſummit, is ſituated horizontally, by ſuppoſing that the planes have a vertical poſition.

The trapeziums *d a f c*, A *p* GC, are the reſult of a decrement by one row on the ridges GO, BR (fig. 66.). The facet *d e b a* (fig. 64.) ariſes from a decrement by two rows parallel to the ridge BO (fig. 66.). With regard to the other facet AB *z p*, which has the ſame poſition as the preceding, in relation to the oppoſite part of the cryſtal, it reſults from an intermediary law, by a row of double molecules on the angle OBR (fig. 66.). The rhombuſes *b c l h*, *k l s u* (fig. 67.) repreſent the horizontal ſections of two of theſe double molecules taken in the ſame row, and whoſe relation to the reſt of the arrangement will become ſenſible, by comparing theſe rhombuſes with thoſe marked with the ſame letters in fig. 65. This variety of cryſtals is ſubject to a change of dimenſions; the faces *p* G *t c d e z*, *f a b n k l i h*, and their oppoſites, which are at right angles to each other, are elongated in the direction of their breadth, exhibiting the appearance of a quadrilateral, rectanglar priſm, the ſummits of which would be formed by the faces ſituated towards the ridges PN, F *t*. Cryſtals of this variety, which are opaque, and of a whitiſh, yellowiſh, and ſometimes reddiſh colour, are found in granites; ſome are in groups, and ſome, but more rarely, are met with in ſingle cryſtals.

III. NUMBER OF PRIMITIVE FORMS.

In the examples which have been given, the author of the theory has choſen the parallelopiped for a nucleus, on account of the ſimplicity of its form. He has hitherto found that all the primitive forms may be reduced to ſix. 1. The parallelopiped in general, which comprehends the cube, the rhomboid, and all the ſolids terminated by ſix faces parallel two and two. 2. The regular tetrahedron. 3. The octahedron with triangular faces. 4. The hexagonal priſm. 5. The dodecahedron with rhomboidal planes. 6. The dodecahedron with iſoſceles triangular faces.

Among theſe forms there are ſome found as nucleus, which have the meaſure of their angles the ſame in different kinds of minerals. It is to be conſidered that theſe nuclei are compoſed, in the firſt inſtance, of elementary molecules, and that it is poſſible that the ſame form of nucleus may be produced in one ſpecies by elements of a certain nature, and in another ſpecies by different elements combined in a different manner, as we ſee integrant molecules, ſome cubic, and ſome tetrahedral, produce ſimilar ſecondary forms by the operation of different laws of decrement. But it may be obſerved, that all the forms which have hitherto occurred as nuclei, on the different ſpecies, are ſuch as have a particular character of perfection and regularity, as the cube, the regular octahedron, and the dodecahedron with equal and ſimilar rhombuſes for its faces.

IV. FORMS OF THE INTEGRAL MOLECULES.

The primitive form is that which is obtained by ſections made on all the ſimilar parts of the ſecondary cryſtal; and theſe ſections, continued parallel to themſelves, conduct to a determination of the form of the integral molecules, of which the whole cryſtal is the aſſemblage. There is no cryſtal from which a nucleus in the form of a parallelopiped may not be extracted, by making the limitation to ſix ſections, parallel two and two. In a great number of ſubſtances, this parallelopiped is the laſt term of the mechanical diviſion, and conſequently the real nucleus; but in ſome minerals this parallelopiped is diviſible, as well as the reſt of the cryſtal, by farther ſections made in the different directions of the faces, from which reſults a new ſolid, which will be the nucleus, if all the parts of the ſecondary cryſtal ſuperadded to this nucleus are ſimilarly ſituated. When the mechanical diviſion conducts to a parallelopiped, diviſible only by ſections parallel to its ſix faces, the molecules are parallelopipeds

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ſimilar to the nucleus; but in all other caſes their form differs from that of the nucleus. This may be illuſtrated by an example.

Let *a c h s n o* (fig. 68.) be a cube, having two of its ſolid angles *a*, *s*, ſituated on the ſame vertical line; this line will be the axis of the cube, and the points *a* and *s* will be its ſummits. Let it be ſuppoſed that this cube is diviſible by ſections, each of which, ſuch as *a h n*, paſſes through one of the ſummits *a*, and by two oblique diagonals *a h*, *a n*, contiguous to the ſummit. By this ſection the ſolid angle *i* will be detached; and as there are ſix ſolid angles, ſituated laterally, viz. *i*, *h*, *c*, *r*, *o*, *n*, the ſix ſections will produce an acute rhomboid, the ſummits of which will be confounded with thoſe of the cube. At fig. 69. this rhomboid is repreſented exiſting in the cube in ſuch a manner, that its ſix lateral ſolid angles *b*, *d*, *f*, *p*, *g*, *e*, correſpond with the middle of the faces *a c h i*, *c r s h*, *h i n s*, &c. of the cube; but each of the angles at the ſummits *b a g*, *d s f*, *p s f*, &c. of the acute rhomboid, are =60°, from which it follows, that the lateral angles *a b f*, *a g f*, &c. are =120°. Beſides, it is proved by theory, that the cube is the reſult of a decrement which takes place by a ſingle row of ſmall rhomboids, ſimilar to the acute rhomboid on the ſix oblique ridges *a b*, *a g*, *a e*, *s d*, *s f*, *s p*. This decrement produces two faces, one on each ſide of each of theſe ridges, making in the whole 12 faces; but as the two faces, having the ſame line of ridge for their departure, are on the ſame plane; by the nature of the decrement, the 12 faces will be reduced to ſix, which are ſquares, ſo that the ſecondary ſolid is a cube.

Suppoſe that the cube (fig. 68.) admits, in regard to its ſummits *a*, *s*, two new diviſions ſimilar to the preceding ſix, one of which paſſes through the points *c*, *i*, *o*, and the other through the points *h*, *n*, *r*. The firſt will alſo paſs through the points *b*, *g*, *e*, and the ſecond through the points *d*, *f*, *p*, (fig. 69. and 70.) of the rhomboid; from which it follows, that theſe two diviſions will each detach a regular tetrahedron *b a g e*, or *d s f p* (fig. 70); ſo that the rhomboid will be found converted into a regular octahedron *e f* (fig. 71.), which will be the real nucleus of the cube; for it is produced by diviſions ſimilarly made in relation to the eight ſolid angles of the cube. If we ſuppoſe the ſame cube to be diviſible throughout its whole extent by analogous ſections, it is clear that each of the ſmall rhomboids, of which it is the aſſemblage, will be found in like manner ſubdivided into an octahedron, and two regular tetrahedrons, applied on the two oppoſite faces of the octahedron. By taking the octahedron for a nucleus, a cube may be conſtructed round it, by regular ſubtractions of ſmall complete rhomboids. If, for example, we ſuppoſe decrements, by a ſingle row of theſe rhomboids, having *b* for the point of their departure, and made in a direction parallel to the inferior edges *g f*, *e g*, *d e*, *d f*, of the four triangles, which unite to form the ſolid angle *b*, there will reſult four faces, which will be found on a level, and like the octahedron, with ſix ſolid angles, ſimilar decrements around the other five angles will produce twenty faces, which taken four and four will be equally on a level, making in the whole ſix diſtinct faces, ſituated as thoſe of the cube (fig. 68.). The reſult will be exactly the ſame as in the caſe of the rhomboid, conſidered as nucleus.

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In whatever way we proceed to ſubdivide, either the cube, the rhombus, or the octahedron, we ſhall always have ſolids of two forms, that is to ſay, octahedrons and tetrahedrons, without being able to reduce the reſult of the diviſion to unity. But the molecules of a cryſtal being ſimilar, Hauy thinks it probable, that the ſtructure was, as it were, interſperſed with a multitude of ſmall vacuities, occupied either with the water of cryſtallization or ſome other ſubſtance; ſo that, if it were poſſible to carry the diviſion to its limits, one of thoſe two kinds of ſolids would diſappear, and the whole cryſtal would be found compoſed only of molecules of the other form. This view is the more admiſſible, as each octahedron being enveloped with eight tetrahedrons, and each tetrahedron being in like manner enveloped with four octahedrons, whichever of theſe forms may be ſuppoſed to be ſuppreſſed, the remaining ſolids will join exactly by their edges; ſo that in this reſpect there will be continuity and uniformity throughout the whole extent of the maſs. It may be readily conceived how each octahedron is enpeloped with tetrahedrons. By attending to the diviſion of the cube only by the ſix ſections which give the rhomboid, we may depart at pleaſure from any two, *a*, *s*; *o*, *h*; *c*, *n*; *i*, *r*, of the eight ſolid angles, provided that theſe two angles be oppoſite to each other. But by departing from the angles *a*, *s*, the rhomboid will be in the poſition ſhewn at fig. 70. If, on the contrary, we depart from the ſolid angles *o*, *h*, theſe angles will become the ſummits of a new rhomboid (fig. 72.), compoſed of the ſame octahedron as that of fig. 71. with two new tetrahedrons applied on the faces *b d f*, *e g p*, (fig. 72.), which were unoccupied on the rhomboid of fig. 70. Fig. 73. repreſents the caſe in which the two tetrahedrons repoſe on the faces *d b e*, *f g p*, of the octahedron; and fig. 74. repreſents the caſe in which they would reſt on the faces *b f g*, *d e p*. Hence, whatever may be the two ſolid angles of the cube aſſumed for the points of departure, we ſhall always have the ſame octahedron, with two tetrahedrons contiguous by their ſummits to theſe two ſolid angles; and there being eight of theſe ſolid angles, the central octahedron will be circumſcribed with eight tetrahedrons, which will reſt on its faces. By continuing the diviſion always parallel to the firſt ſections, the ſame effect will always take place. Each face of the octahedron, however ſmall it may be ſuppoſed to be, adheres to a face of the tetrahedron, and reciprocally; and each tetrahedron is enveloped with four octahedrons.

The ſtructure which is here explained is that of fluate of lime, or fluor ſpar. By dividing a cube of this ſubſtance, we may at pleaſure extract rhomboids which have the angles formed by their planes equal to 120°, or regular octahedrons, or tetrahedrons equally regular. In ſome other ſubſtances, as rock cryſtal, carbonate of lead, &c. which being mechanically divided beyond the term at which we ſhould have a rhomboid or a parallelopiped, parts of various different forms are obtained, arranged together even in a more complicated manner than in fluor ſpar. In conſequence of theſe mixed ſtructures, there is ſome uncertainty reſpecting the real figure of the integral mole-

cules

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lecules which belong to theſe ſubſtances. It is obſerved, however, that the tetrahedron is always one of thoſe ſolids which concur to the formation of ſmall rhomboids or parallelopipeds that would be extracted from the cryſtal by a firſt diviſion. But, on the other hand, there are ſubſtances, which being divided in every poſſible direction, reſolve themſelves only into tetrahedrons. Garnet, blendes, and tourmaline, belong to this number.

Several minerals are diviſible into right triangular priſms. Such is the apatite, whoſe primitive form is a regular right hexahedral priſm, diviſible parallel to its baſes and its planes, from which neceſſarily reſult right priſms with three planes. Fig. 76. repreſents one of the baſes of the hexahedral priſm, divided into ſmall equilateral triangles, which are the baſes of ſo many molecules, and which being taken two and two, form quadrilateral priſms, with rhombuſes for their baſes.

By adopting then the tetrahedron, in the doubtful caſes already mentioned, all the forms of integral molecules may be in general reduced to three, which are remarkable for their ſimplicity, viz. the parallelopiped, the ſimpleſt of all the ſolids, having parallel faces two and two; the triangular priſm, the ſimpleſt of all priſms; and the tetrahedron, which is the ſimpleſt of pyramids. This ſimplicity may furniſh a reaſon for the preference given to the tetrahedron in fluor ſpar, and the other ſubſtances which have been mentioned as examples. But the ingenious author of the theory cautiouſly declines to ſpeak deciſively on the ſubject, as the want of direct and preciſe obſervations, he obſerves, leaves to theory only conjectures and probabilities.

But the eſſential object is, that the different forms to which theſe mixed ſtructures lead, are arranged in ſuch a manner, that their aſſemblage is equivalent to a ſum of ſmall parallelopipeds, as has been ſeen to be the caſe in regard to fluor ſpar; and that the laminæ of ſuperpoſition applied on the nucleus, decreaſe by ſubtractions of one or more rows of theſe parallelopipeds. The baſis of the theory exiſts, therefore, independently of the choice which might be made of any of the forms obtained by the mechanical diviſion.

With the help of this reſult, the decrements to which cryſtals are ſubject, whatever be their primitive forms, are found reducible to thoſe which take place in ſubſtances, where this form, as well as that of the molecules, are indiviſible parallelopipeds; and the theory has this advantage of being able to generaliſe its object, by connecting with one fact, that multitude of facts which, on account of their diverſity, ſeem to be little ſuſceptible of being brought to one common point. But what has been ſaid, will be ſtill more illuſtrated by examples of the manner in which we may reduce to the theory of the parallelopiped, that of the forms which are different from that ſolid.

Cryſtals whoſe Molecules are Tetrahedrons, with Iſoſceles Triangular Faces.

Garnet.

1. *Primitive Garnet* (fig. 76.).

Geometric Character.—Reſpective inclinations of any two of the faces of the dodecahedron, 120°. Angles of the rhombus CLGH, C or G = 109° 28′ 16″; L or H = 78° 31′ 44″.

Structure of Cryſtals.

Notwithſtanding the vitreous appearance in general exhibited on the fractures of garnets of the primitive form, laminæ may be perceived on them, ſituated parallel to the rhombuſes which compoſe their ſurface. Let us ſuppoſe the dodecahedron divided in the direction of its laminæ, and for the greater ſimplicity, let us ſuppoſe the ſections to paſs through the centre. One of theſe ſections, viz. that which will be parallel to the two rhombuſes DLFN, BHOR, will concur with a hexagon, which would paſs through the points E, C, G, P, I, A, by making the tour of the cryſtal. A ſecond ſection parallel to the two rhombuſes GLPF, BEAR, will coincide with another hexagon ſhewn by the points D, C, H, O, I, N. And if the diviſion be continued parallel to the other eight rhombuſes, taken two and two, it will be found that the planes of the ſections will be confounded with four new hexagons analogous to the preceding. But by reſuming all theſe hexagons, it will appear that their ſides correſpond, ſome of them with the ſmall diagonals of the rhombuſes of the dodecahedron, viz. thoſe which would be drawn from C to G, from A to I, from C to B, &c. and others would correſpond with the different ridges EC, GP, PI, EA, &c.

1. The planes then of the ſections paſſing through the ſides and through the ſmall diagonals of the twelve rhombuſes, will ſubdivide the whole ſurface into 24 iſoſceles triangles, which will be the halves of theſe rhombuſes. 2. Since the planes of the ſections paſs alſo through the centre of the cryſtal, they will detach 24 pyramids with three faces; the baſes of which, if we chooſe, will be the external triangles that make part of the ſurface of the dodecahedron and of which the ſummits will be united in the centre.

Beſides, if we take, for example, the ſix tetrahedrons, which have for external faces the halves of the three rhombuſes CEDL, CLGH, CEBH, theſe ſix tetrahedrons will form a rhomboid repreſented by fig. 77. and in which the three inferior rhombuſes DLGS, GHBS, DEBS, reſult from three diviſions which paſs, one through the hexagon DLGORA, (fig. 76.); the ſecond through the hexagon GHBANF; and the third through the hexagon BEDFPO. Fig. 77. alſo repreſents the two tetrahedrons, the baſes of which make part of the rhombus CLGH. One of theſe is marked with the letters, L, C, G, S, and the other with the letters H, C, G, S. And by applying what has been ſaid to the other nine rhombuſes, which are united, three and three, around the points F, A, H, (fig. 77.) we ſhall have three new rhomboids; from which it follows, that the 24 tetrahedrons, conſidered ſix and ſix, form four rhomboids; ſo that the dodecahedron may be conceived as being itſelf immediately compoſed of theſe four rhomboids, and in the laſt analyſis of 24 tetrahedrons.

It may be obſerved, that the dodecahedron having eight ſolid angles, each formed with three planes, they might have been conſidered as the aſſemblage of the four rhomboids, which would have for exterior ſummits the four angles G, B, D, A; from which it follows that any one of the faces, ſuch as CLGO, is common to two rhomboids, one of which would have its ſummit in C, and the other in G, and which would themſelves have a common part in the interior of the cryſtal.

We may remark farther, that a line GS (fig. 77.) drawn from any one G (fig. 76.) of the ſolid angles compoſed of three planes, as far as the centre of the dodecahedron, is at the ſame time the axis of the rhomboid, which would have its ſummit in C (fig. 76. and 77.). The compoſing rhomboids then have this property, that their axis is equal to the ſides of the rhombus. From which, with a little attention, we may conclude, that in each tetrahedron, ſuch as CLGS (fig. 77.), all the faces are equal and ſimilar iſoſceles triangles.

If the diviſion of the dodecahedron be continued by ſections paſſing between thoſe which we have ſuppoſed to be directed towards the centre, and which ſhould be parallel to them, we ſhould obtain tetrahedrons always ſmaller, and arranged in ſuch a manner, that taking them in groups of ſix, they would form rhomboids of a bulk proportioned to their own.

The tetrahedrons, which would be the term of the diviſion, were it poſſible to reach it, ought to be conſidered as the real molecules of the garnet. But it will be ſeen, that in the paſſage to the ſecondary forms, the laminæ of ſuperpoſition, which envelope the nucleus, really decreaſe by rows of ſmall rhomboids, each of which is the aſſemblage of theſe tetrahedrons.

The ſulphuret of zinc, or blende, has the ſame ſtructure as the garnet. Hauy informs us that he has divided fragments of this ſubſtance by very clean ſections, in ſuch a manner as to obtain ſucceſſively the dodecahedron, the rhomboid and the tetrahedron.

2. *Trapezoidal Garnet*, (fig. 78.).

Geomet. Character.—Reſpective inclination of the trapezoids, united three and three around the ſame ſolid angle D, C, G, &c. 146° 26′ 33″; of the trapezoids united four and four around the ſame ſolid angle *u*, *x*, *r*, &c. 131° 48′ 36″. Angles of any one of the trapezoids *m* D *u* L, L=78° 27′ 46″; D=117° 2′ 8″; *m* or *u*=82° 15′ 3″. The value of the angle L is the ſame as that of the acute angle of the nucleus of calcareous ſpar.

This variety is the reſult of a ſeries of laminæ, decreaſing at the four edges, on all the faces of the primitive dodecahedron. For the more ſimplicity, let us firſt conſider the effect of this decrement in regard to the rhombus CLGH (fig. 76.). We have juſt ſeen that this rhombus was ſuppoſed to belong in common to two rhomboids, which ſhould have for ſummits, one, the point C, and the other the point G. Let us ſuppoſe that the laminæ applied on this rhombus decreaſe towards their four edges by ſubtractions of a ſingle row of ſmall rhomboids, in ſuch a manner that in regard to the two edges CL, CH, circumſtances are the ſame as if the rhombus belonged to the rhomboid which has its ſummit in C; and that in regard to the other two edges GL, GH, the effect is the ſame as if the rhombus belonged to the rhomboid, which has its ſummit in G. This diſpoſition is admiſſible here in conſequence of the particular ſtructure of the dodecahedron, which permits us to obtain ſmall rhomboids; ſome of which have their faces parallel to the faces of that with its ſummit in C, and the reſt to that having its ſummit in G (D).

The reſults of the four decrements being thus quite ſimilar to each other, the laminæ of ſuperpoſition, applied on the rhombus CLGH, and on each of the other rhombuſes of the dodecahedron, will form as many right quadrangular pyramids, which will have for baſes theſe ſame rhombuſes. Fig. 79. repreſents the pyramids which reſt on the three rhombuſes CLDE, CEBH, CGHB (fig. 76.), and which have for ſummits the points *m*, *e*, *s*, (fig. 76.); but on account of the decrement by a ſimple row, the adjacent triangular faces, ſuch as E*m*C, E*s*C of the two pyramids that belong to the rhombuſes CLDE, CEBH, are on a level, and form a quadrilateral E*m*C*s*. But we had 12 pyramids, and conſequently 48 triangles. Theſe divided by two give 24 quadrilaterals, which will compoſe the ſurface of the ſecondary cryſtal. But becauſe the rhomboidal baſes of the two pyramids extend more, in proceeding from L to E, or from H to E, than in proceeding from D to C, or from B to C, the ſides *m*E, E*s* of the quadrilateral will be longer than the ſides C*m*, C*s*. And beſides *m*E will be equal to E*s*, and C*m* equal to C*s*. Thus the quadrilaterals will be trapezoids which have their ſides equal two and two. There is no cryſtalline form in which the ſtriæ, when they do exiſt, ſhew in a more ſenſible manner the mechaniſm of the ſtructure than in this variety of garnet. We may here ſee the ſeries of decreaſing rhombuſes which form each of the pyramids CLDE*m*, CEBH*s*, &c. (fig. 79.), and ſometimes the furrows are ſo deep that they produce a kind of ſtair, the ſteps of which have a more particular poliſh and brilliancy than thoſe of the facets, which are parallel to the faces CEDL, CHBE, of the nucleus.

If the decrements ſtop abruptly at a certain term, ſo that the pyramids are not terminated, the 24 trapezoids will be reduced to elongated hexagons, which will intercept 12 rhombuſes parallel to the faces of the nucleus. To this variety Hauy has given the name of *intermediary garnet*.

In the ſulphuret of zinc the regular octahedron is the reſult of a decrement by a row around the eight ſolid angles, compoſed of three planes, viz. C, B, O, G, F, D, A, I, (fig. 76.). The ſame ſubſtance alſo aſſumes the form of a regular tetrahedron, by the help of a decrement by one row on four only of the eight ſolid angles before mentioned, ſuch as C, O, F, A. The ſtructure of this tetrahedron is remarkable, as it preſents an aſſemblage of other tetrahedrons with iſoſceles faces.

(D) Theory, the author obſerves, has conducted him to another reſult, which is, that the ſum of the nucleus and laminæ of ſuperpoſition taken together in proportion as the latter are applied one upon the other is always equal to a ſum of rhomboids; though at firſt view it does not appear that this ſhould be the caſe, according to the figure of theſe laminæ, which repreſent riſing pyramids.

Cryſtals whoſe Molecules are Triangular Priſms.

Oriental.

Hauy has thus denominated the gem which is known under the different names of *ruby*, *ſapphire*, *oriental topaz*, according as the colour is red, blue, or yellow. The different varieties of this gem have not been accurately deſcribed, and the nature of the particular angles of each has not been preciſely indicated, on account of the rare occurrence of regularly formed cryſtals, or, when ſuch have been found, on account of their being defaced by being water-worn, or otherwiſe injured. But from ſome cryſtals which were ſufficiently characteriſed, Hauy obtained the following reſults.

1. *Primitive Oriental.*

This mineral cryſtallizes in the form of a regular hexahedral priſm which is diviſible parallel to its baſes. According to theory, which points out other joinings parallel to the planes, the molecule is an equilateral triangular priſm. The height of this priſm, calculated by theory, is a little leſs than three times the height of the triangle of the baſe.

2. *Elongated Oriental*, (fig. 80.)

Geometric Character.—Reſpective inclinations of the triangles IAS, IBS, 139° 54′. Angles of the triangle IAS, A=22° 54′. I or S=78° 47′.

This form is the reſult of a decrement by a ſimple row of ſmall quadrangular priſms on all the edges of the baſes of the nucleus. Let *qd* (fig. 75.) be the ſuperior baſe, ſubdivided into ſmall triangles, which repreſent the analogous baſes of ſo many molecules. The edges of the laminæ of ſuperpoſition will correſpond ſucceſſively to the hexagons *hilmnr*, *ekuxyv*, &c.; from which it follows that the ſubtractions take place by rows of ſmall parallelopipeds of quadrangular priſms, compoſed each of two triangular priſms.

3. *Minor Oriental.*

Geometric Character.—Dodecahedron formed of two right pyramids leſs elongated than thoſe of the preceding variety. The triangles correſponding to IAS, IBS, are inclined to each other 122° 36′. In each of theſe triangles the angle of the ſummit is 31°, and each of the angles at the baſe is 74° 30′.

The law of which this variety is the reſult, differs from that which produces the preceding, as it determines a mixed decrement by three rows in breadth and two rows in height.

4. *Enneagonal Oriental*, (fig. 81.)

Geometric Character.—Inclination of each ſmall triangle, ſuch as *cqi*, to the adjacent baſe *aciplbged*, 122° 18′.

This is the elongated oriental, whoſe ſummits are replaced by two faces, parallel to the baſes of the nucleus, with the addition of ſix ſmall iſoſceles triangles *cqi*, *lbf*, *vzm*, &c. the three ſuperior of which are alternate in poſition with the three inferior. Theſe triangles are the reſult of a decrement, by three rows of ſmall quadrangular priſms on the three angles of the ſuperior baſe of the nucleus, ſuch as *b*, *d*, *g* (fig. 75), and on the intermediate angles of the inferior baſe. It may be readily conceived, that in the decrement which takes place, for example, on the angle *g*, the three rows which remain unoccupied between that angle and the correſponding edge of the firſt lamina of ſuperpoſition, are, 1. the ſmall rhombus *goip*, which alone forms the firſt row; 2. the two rhombuſes *osti*, *pzdi*; 3. the three rhombuſes ſituated on the ſame line behind the two preceding.

Cryſtals of this gem are chiefly found in the kingdom of Pegu. Some have been found in France, which have received the name of ſapphires of Puy. They have been alſo found at a little diſtance from Velay, on the banks of a rivulet near the village of Expailly, where they are mixed with garnets and hyacinths. Theſe have all the characters of the ſtone which is denominated *oriental ſapphire*.

V. DIFFERENCE BETWEEN STRUCTURE AND INCREMENT.

In what has been ſaid reſpecting the decrements to which the laminæ of ſuperpoſition are ſubjected, the author obſerves, that it was his view only to unfold the laws of ſtructure; and he adds, that he is far from believing that in the formation of a dodecahedral cryſtal, or one of any other form, having a cube for a nucleus, the cryſtallization has originally produced that nucleus ſuch as it is extracted from the dodecahedron, by the ſucceſſive application of all the laminæ of ſuperpoſition with which it is covered. It ſeems proved, on the contrary, that from the firſt moment the cryſtal is already a very ſmall dodecahedron, containing a cubical nucleus proportioned to its ſmall ſize, and that the cryſtal afterwards increaſes by degrees without changing its form, by new layers which envelope it on all ſides, ſo that the nucleus increaſes alſo, preſerving always the ſame relation with the whole dodecahedron.

An example taken from a plane figure will make this more ſtriking; and what is ſaid reſpecting this figure may be eaſily applied to a ſolid, ſince a plane figure may be always conceived as a ſection of a ſolid. Let ERFN (fig. 82.) be an arrangement of ſmall ſquares, in which the ſquare ABCD, compoſed of 49 partial ſquares, repreſents a ſection of the nucleus, and the extreme ſquares R, S, G, A, I, L, &c. that of the kind of ſtair formed by the laminæ of ſuperpoſition. It may be readily conceived, that the arrangement began with the ſquare ABCD; and that different files of ſmall ſquares were afterwards applied on each of the ſides of the central ſquare: for example, on the ſide AB, firſt the five ſquares comprehended between I and M, next the three ſquares comprehended between L and O, and then the ſquare E. This increment correſponds with that which would take place if the dodecahedron began by being a cube proportioned to its bulk, and which increaſed afterwards with the addition of continually decreaſing laminæ.

But on the other hand, the arrangement may be conceived to be ſuch as is repreſented in fig. 84. in which the ſquare *abcd* is compoſed of only nine molecules, and bears upon each of its ſides only one ſquare e, n, f, or r; and that afterwards by means of the application of new ſquares arranged around the former, the aſſortment has become that of fig. 83. where the central ſquare $a'\ b'\ c'\ d'$ is formed of 25 ſmall ſquares, and bears on each ſide of its ſides a file of three ſquares, plus a terminating ſquare e', n', f', or r'; and that, in ſhort, by a farther application, the aſſortment of fig. 83. is converted into that of fig. 82. Theſe different tranſitions will give ſome notion of the manner in which ſecondary cryſtals may increaſe in bulk, and yet retain their form; and from this it will appear, that the ſtructure is combined with that augmentation of bulk, ſo that the law, according to which all the laminæ applied in the nucleus of the cryſtal, when arrived at its greateſt dimenſions, ſucceſſively decreaſe, in departing from this nucleus, exiſted already in the riſing cryſtal.

Such is the ingenious theory of the ſtructure of cryſtals, which the author obſerves, is in this ſimilar to other theories, that it ſets out from a principal fact, on which it makes all facts of the ſame kind to depend, and which are only as it were corollaries. This fact is the decrement of the laminæ ſuperadded to the primitive form; and it is by bringing back this decrement to ſimple and regular laws, ſuſceptible of accurate calculation, that theory arrives at reſults, the truth of which is proved by the mechanical diviſion of cryſtals, and by obſervation of their angles. But new reſearches are ſtill wanting, in order to aſcend a few ſteps farther towards the primitive laws by which cryſtallization is regulated. The object of one of theſe reſearches would be to explain how theſe ſmall polyhedrons, which are as it were the rudiments of cryſtals of a ſenſible bulk, ſometimes repreſent the primitive form, without modification; ſometimes a ſecondary form produced in virtue of a law of decrement; and to determine the circumſtances which produce decrements on the edges, as well as thoſe which give riſe to decrements on the angles.

END OF THE SIXTH VOLUME.

DIRECTIONS FOR PLACING THE PLATES OF VOL. VI.

Part I.	Page
Plate CXLV. to face	94
CXLVI.—CXLVIII.	208
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CLII.—CLV.	484
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CLXV.—CLXVII.	808

ERRATA IN CONIC SECTIONS.

Page 527. *col.* 2. *line* 7. *from bottom, for* (Cor. 5.) *read* (1 Cor. 5.)
538. *col.* 2. *line* 14. *for* Cor. 2. Prop. *read* Cor. 2. Prop. 8.
543. *col.* 2. *line* 21. *for* and AH, *read* and take AH.
547. *col.* 2. *line* 5. *from bottom, for* *p* P : *p* S *read* *p* P : LP.
548. *col.* 2. *line* 26. *for* (18. Part II. and 25. Part III.) *read* (Cor. 17. Part II. and Cor. 25. Part III.)
— *col.* 2. *line* 32. *for* (14. Part II.) *read* (15. Part II.)

CRYSTALLIZATION.

Plate CLXV.

Fig. 1. Nitre or Salt Petre.

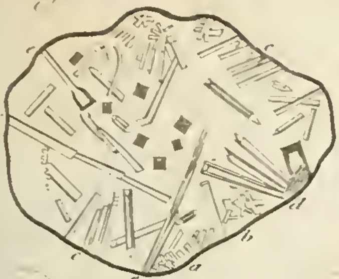


Fig. 2. Blue Vitriol.

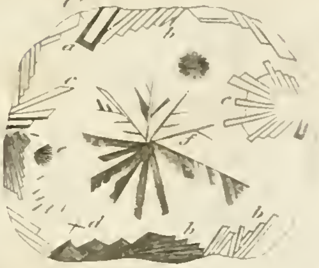


Fig. 3. Verdigrease distilled.

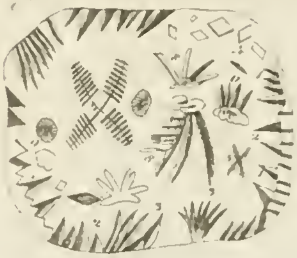


Fig. 4. Alum.

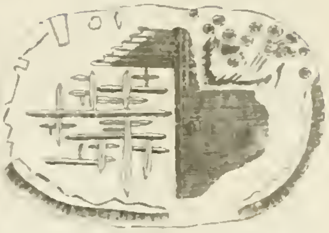


Fig. 5. Borax.

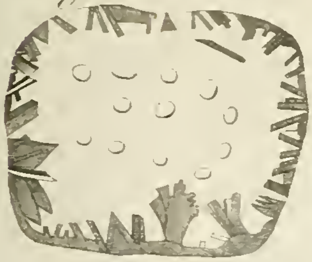


Fig. 6. Sal Ammoniac.

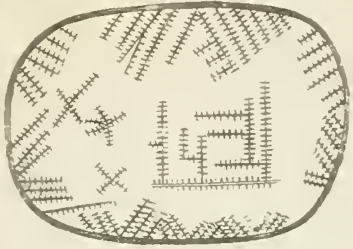


Fig. 7. Salt of Lead.

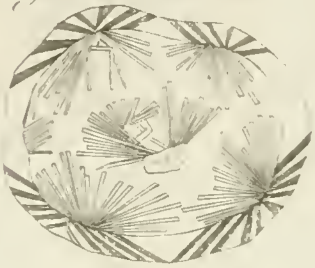
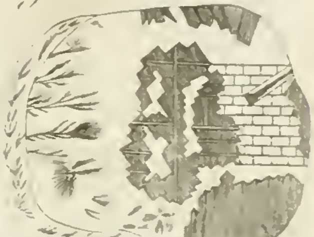


Fig. 8. Glaubers Salt.



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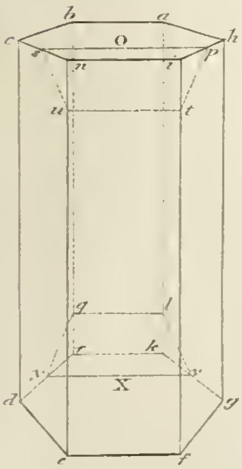

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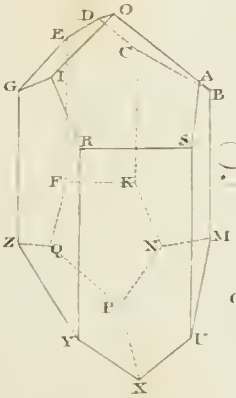

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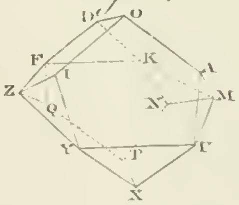

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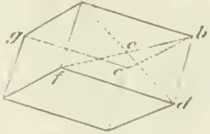

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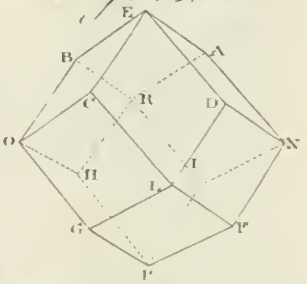

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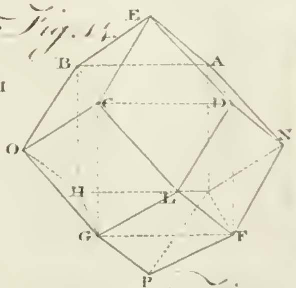

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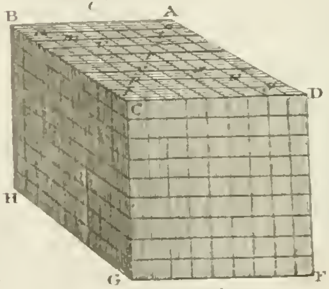

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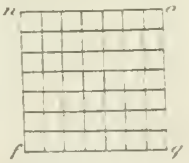

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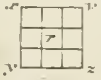

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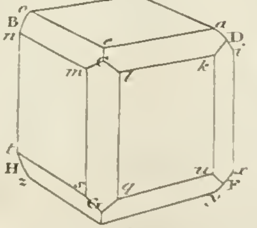
Fig. 21.



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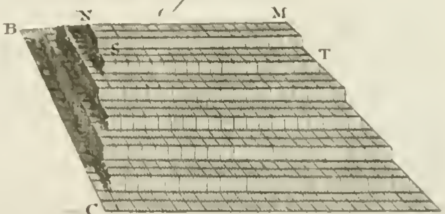

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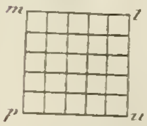

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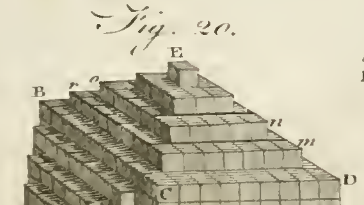

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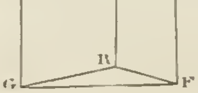

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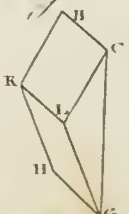

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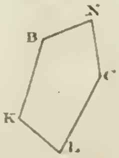

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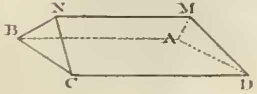

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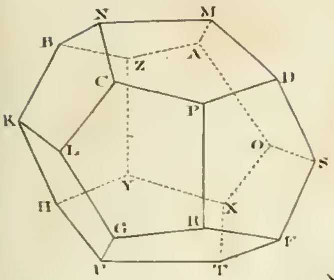
Fig. 27.



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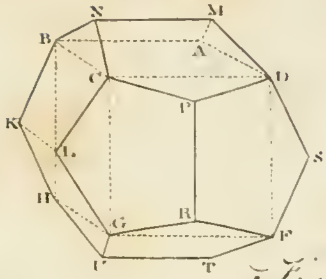

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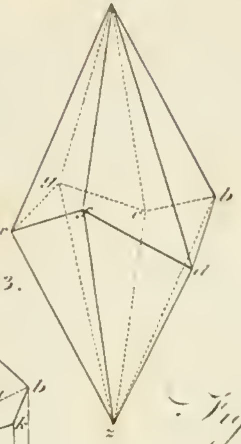

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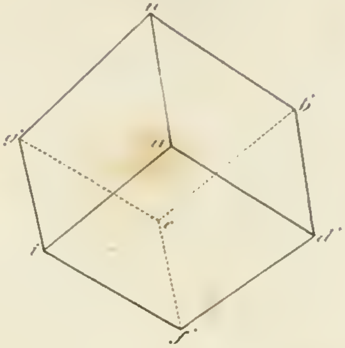

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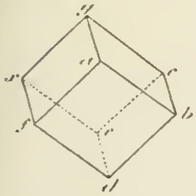

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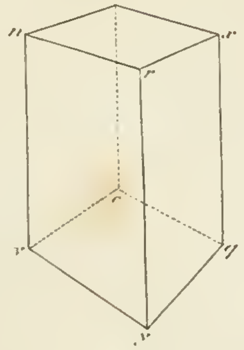

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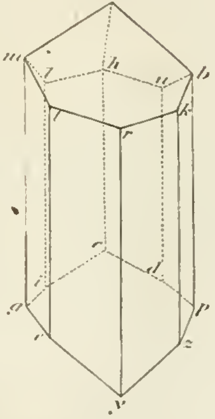

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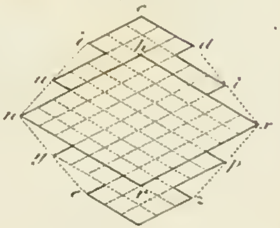

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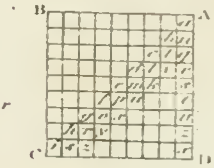

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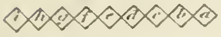

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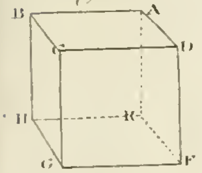

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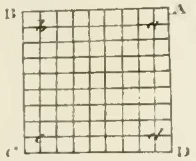

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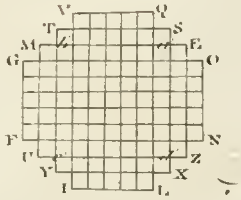

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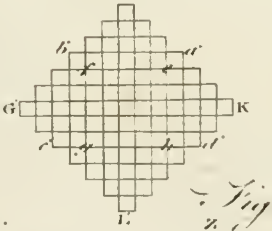

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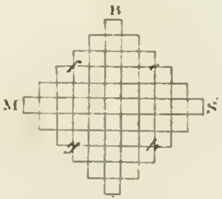

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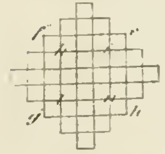

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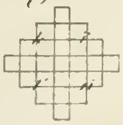

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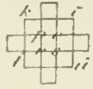

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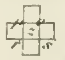
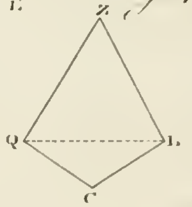


Fig. 46.

Fig. 47.



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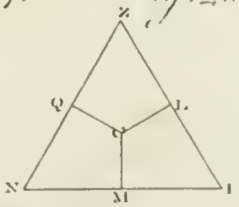

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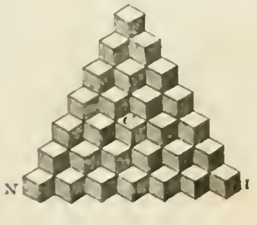

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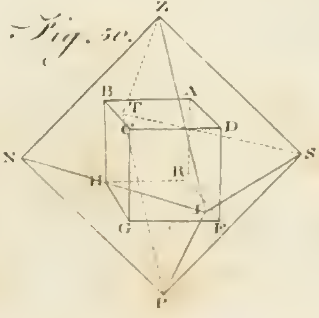

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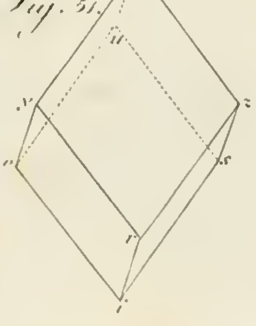

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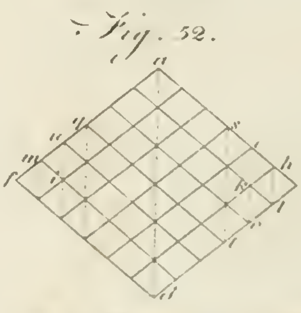

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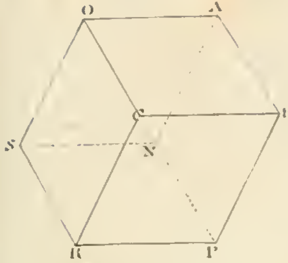
CRYSTALLIZATION. Plate CLXVII.

Fig. 53.



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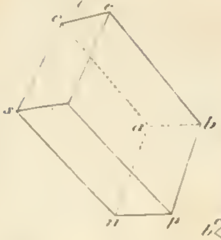

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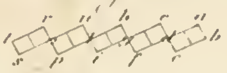

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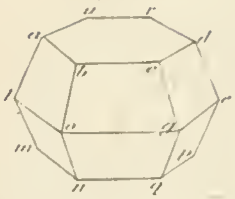

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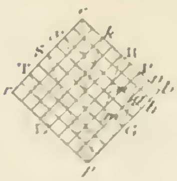

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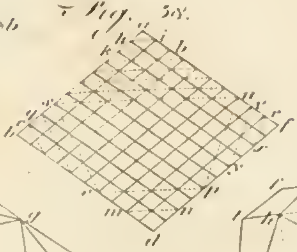

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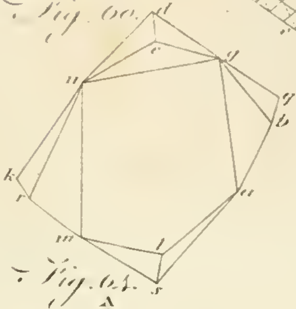

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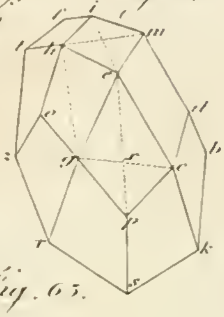

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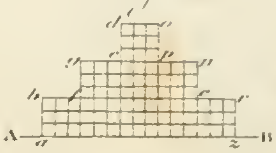

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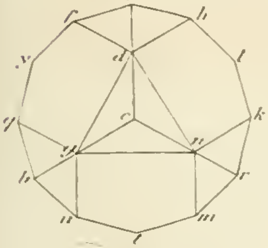

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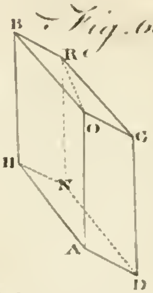

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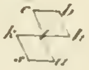

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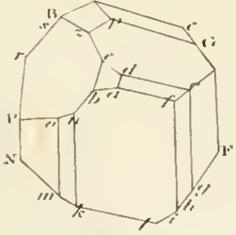

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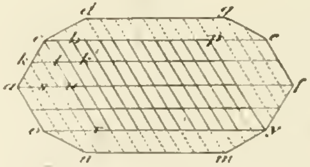

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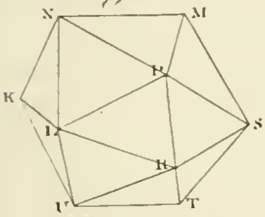

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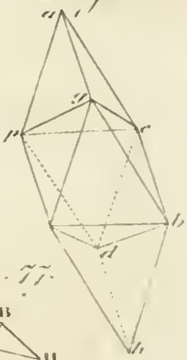

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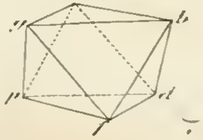

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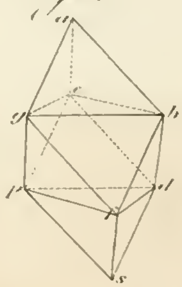

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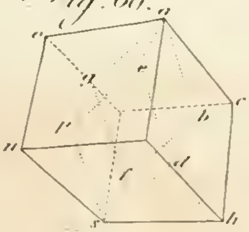

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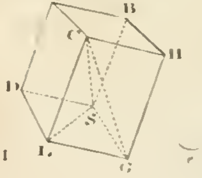

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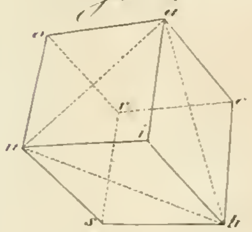

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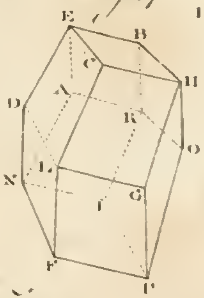

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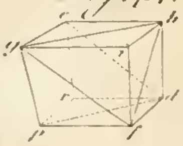

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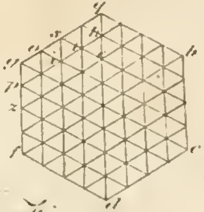

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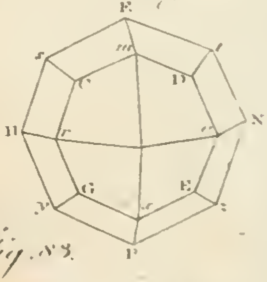

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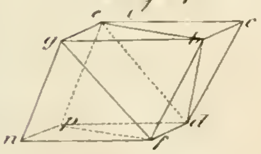

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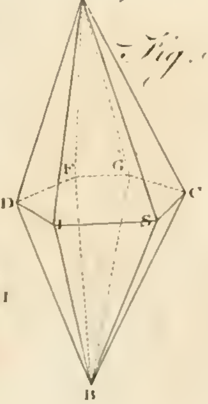

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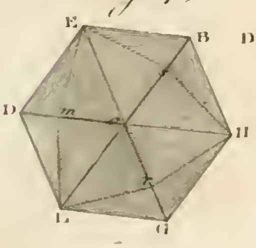

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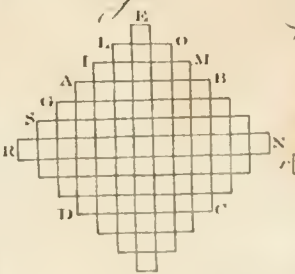

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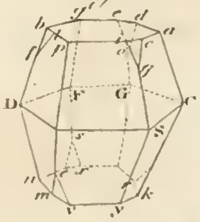

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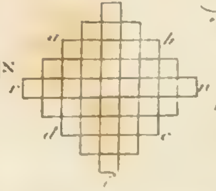

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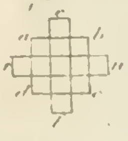

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